MARCH 30, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

No. 2 of a Management Series . . .

Mr. "B" Looks to Washington

You can help put more business in government and less government in business — p. 53

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Have You Received YOUR Copies of the NEW

KORHUMEL SPRING STEEL and ALUMINUM

Special Stock Lists?

Another example of Korhumel Personalized Warehouse Service . . .

STEEL
Cold and Hot Rolled
Strip and Sheet
Spring Steel, Tempered and Annealed
Feeler Gauge
Round Edge Flat Wire
Shim Steel
Electro Galvanized
Electrical Sheets
Tin Plate
Cold Finished Bars
Tubing, Seamless, Welded
Rigidtex Stainless
Hydraulic Tubing

ALUMINUM
Strip and Sheet
Coils
Straight Lengths
Bars

PHOSPHOR BRONZE
Coils and Flats

SERVICES
Slitting
Shearing
Edge Rolling
Bright Annealing
Cold Rolling
Ungerer Roller Leveling

Here are two new handy guides to help you simplify and speed up selection, specifying and ordering of spring steel and aluminum. These two new Korhumel stock lists were especially designed to make your job easier. They are exceptionally easy to use . . . they are up-to-date and periodically revised to keep them up to date. Stock lists on all other Korhumel products will be available shortly . . . they too, will be prepared to make your job easier. Just another example of what the "Personalized" means in Korhumel Personalized Warehouse Service.

Why not write for your free Stock List copies today? We will add your name to our regular stock list mailing list.

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They Haul Oil, Machinery and Ice Cream

Yet They have One Advantage in Common

Mayari R makes it lighter... stronger... longer lasting

It would be hard to select three vehicles that vary more in design and purpose than these. But dissimilar as they are, they all share one important feature—each is built with low-alloy, high-strength Mayari R.

There seems to be no limit on the types of trucks, trailers and other highway vehicles that can be built better with this versatile steel. In some instances vehicle designers are interested primarily in increasing strength; in some they are interested solely in reducing deadweight without sacrificing strength; in others they aim at a middle course by combining a moderate increase in strength with a corresponding reduction in deadweight. Engineers have their choice when they work with Mayari R.

Another thing that can be counted on with this steel is increased resistance to atmospheric corrosion. Mayari R will resist corrosion damage 5 to 6 times longer than plain carbon steel of equal gage. It will also retain paint up to 80 pct longer, depending upon the composition of the paint used.

Get more information on Mayari R. Take advantage of its properties to improve your present designs. Our Catalog 259 will explain Mayari R features and applications in detail.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Packard engineers saved $1.74 per part when this ultramatic transmission shaft was redesigned from a forging to a steel shaft and casting. They saved $74,325 in equipment and tooling, too.
Auto parts manufacturer saves $2000 monthly brazing shanks on hi-speed lathe tool stubs. Formerly these $17.00 tools had to be discarded when worn down to 4". Now they use up 100% of the tool.
Here's how you can save time and money with TOCCO* Induction Brazing
American Emblem Co. reduced solder cost 50%; cut repairs and rework due to misalignment of parts 98% and doubled output when they switched from hand soldering to automatic TOCCO soldering.
Commercial Shearing and Stamping Co. changed from welding to TOCCO brazing these hydraulic cylinder assemblies and doubled production while cutting unit costs 50%.
Nash Motors changed from a hand torch to TOCCO Induction brazing of drain flanges to oil pans. Labor and material costs dropped from $12.75 to $4.90 per hundred—a cut of 60%. Hourly production more than tripled.
Norris-Thermador Corporation switched from arc welding to TOCCO Induction Brazing of this bushing and clamp assembly. Result: costs reduced from $46.44 to $31.73 per 1000 parts—a 32% saving.

If your product involves brazing, heat-treating, forging or melting of ferrous or non-ferrous metals, similar savings of time and money can probably be uncovered in your plant, too. A TOCCO engineer is glad to survey your plant without obligation, of course.

THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today

FREE BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. S-3, Cleveland 1, Ohio

Please send free copy of "Typical Results of TOCCO Induction Brazing and Soldering."

Name_____

Position_____

Company_____

Address_____

City_____ Zone____ State_____

OSBORN

Brush C deburrs bottom of slot

Push-button brushing deburrs 1400 parts per hour

The Problem here was to remove feather burrs from a machined slot in aluminum ammunition components . . . *fast.* By a hand method, *output was only 360 per hour* and results were not uniform.

With the help of the **O**sborn **B**rushing **A**nalyst, the company built the rotating fixture shown above, equipped with three Osborn Master-Wheel brushes. Parts are placed on pins on clockwise-rotating table. Brush A, rotating clockwise, deburrs the corner of one side of slot. Brush B, rotating counterclockwise, deburrs the other side corner. Brush C deburrs the bottom corner. Slots come clean and smooth . . . *at a rate of 1400 per hour!*

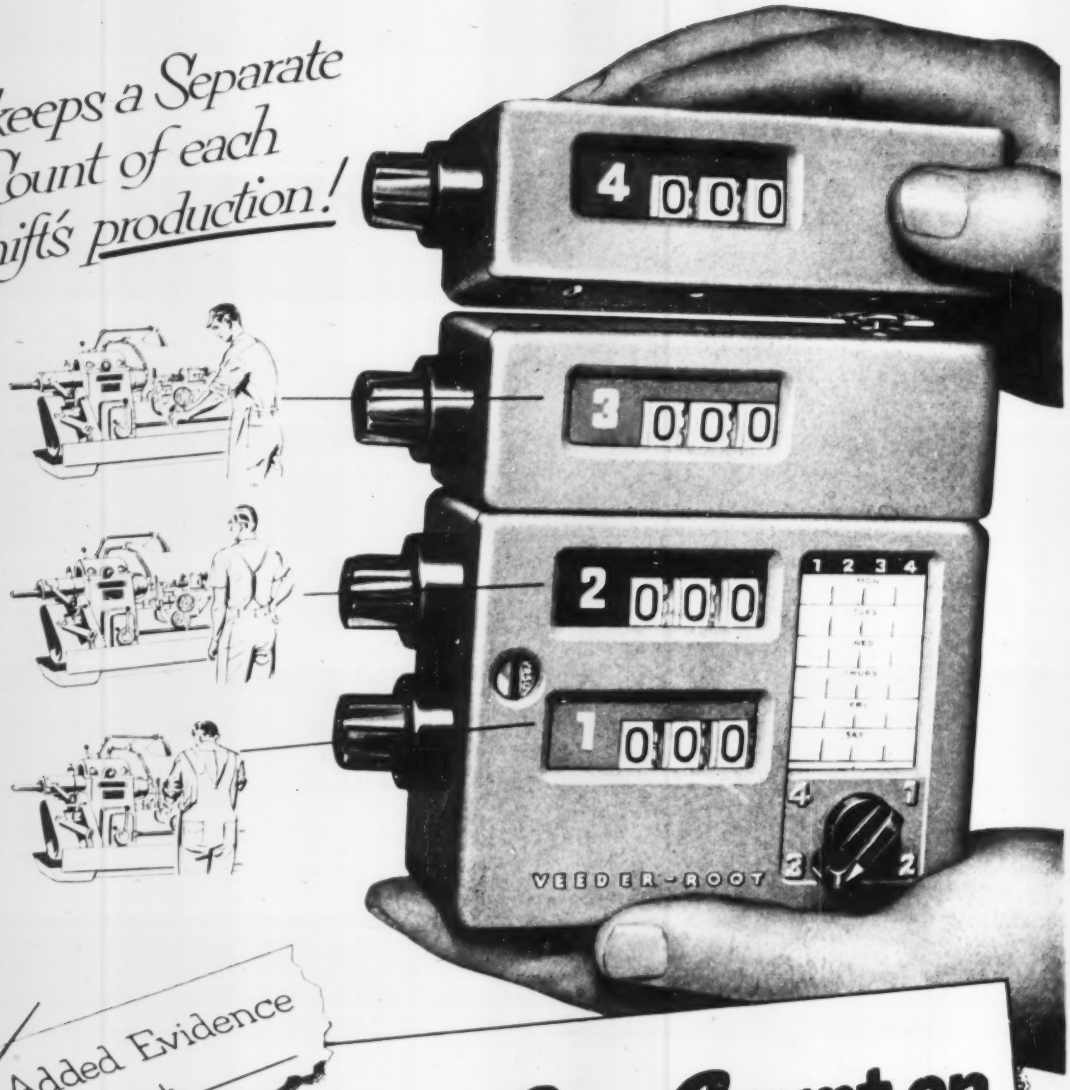
Find out how power brushing can improve *your* product deburring, cleaning and finishing! Call the **OBA** or write *The Osborn Manufacturing Company, Dept. G-4, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Brushes A and B deburr side corners. Brushes rotate at 3450 rpm.

Osborn Brushes

OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES

It keeps a Separate Count of each shift's production!



Added Evidence that

Everyone Can Count on VEEDER-ROOT

Here's a counter whose "count-ability" challenges your imagination. For this counter records, on a separate counting unit, the production of 1, 2, 3, or more shifts. The additional 4th unit can be used as a run or batch counter. These Veeder-Root 2-3-4 Convertible Shift Counters are applicable to a wide variety of production machines, to count in practically any unit desired . . . revs, strokes, pieces, or what do *you* want to count? *Write:*

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This Week in Metalworking

STEEL

Vol. 132 No. 13 Mar. 30, 1953

✓NEWS ✓PRODUCTION-ENGINEERING ✓MARKETS

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What's ahead for metalworking? The editors explore various aspects of business to help you plan for the future

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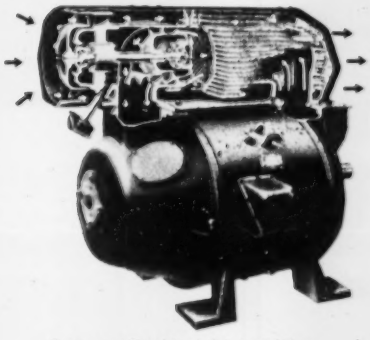
Effective cooling for adjustable speeds



Cutaway of Dual Cooled Type 'T' Heavy Duty D-C Motor showing counterflow of internal and external cooling air through heat exchanger.

RELIANCE
Totally-Enclosed Dual-Cooled
D-C. MOTORS

The new Reliance Dual-Cooled Motor runs cool at all speeds. It is especially adaptable to Reliance Adjustable-Speed V•S Drives. Two separate cooling systems function independently of motor speed. The internal system uses high-velocity air to carry motor heat to the finned inner duct of the heat exchanger. The external system dissipates this heat by sweeping air through the fins of the outer duct.

Reliance Dual-Cooled Motors are available in totally-enclosed ratings from 15 through 150 horsepower, and explosion-proof, conforming to Underwriters and Bureau of Mines specifications, through 100 hp.

GET THESE FACTS NOW!

This fact-filled booklet features a large cutaway drawing with 5-color transparent overlay showing cooling principle. For your copy, call the nearest Reliance Sales Office or write for Bulletin C-2201.

RELIANCE
ELECTRIC AND ENGINEERING CO.
1081 Ivanhoe Road • Cleveland 10, Ohio
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LAST LONGER... MARK BETTER

7 REASONS WHY:

1. High tensile tool steel, for durability.
2. Roundedhead distributes hammer blows more evenly for better impressions, less "mushrooming," longer life.
3. Character and size plainly stamped on front for quick, easy identification.
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Use Pannier "Master Marker" Steel Stamps for a long life of cleancut, legible impressions. Write for complete listing of styles and sizes.

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Pittsburgh 12, Pa.

Behind the Scenes...

Mr. Cook, Thank You!

It's been a long time since we referred to our orange crate desk but W. M. Cook of Square D Company remembers it, and by golly it's just as good as new, which is saying absolutely nothing. But that's getting off the track of Mr. Cook's nice letter which we really did appreciate. He writes:

> I have read STEEL with pleasure and profit over quite a number of years but will be retiring at the end of this month and will no longer need to keep informed along the lines so ably presented in your magazine, especially on page 6.
>
> As my future schedule includes some wood-working, perhaps some spare parts for your orange crate would be in order. Please advise.

Tell you what we really could use, and that's a little drawer of some kind to hold our green eye shade. Almost every night Geraldine, the cleaning woman, hides it some different place and every morning we have to get down to work a half hour early in order to find it.

Meet Vance Bell . . .

Got past the barricaded door last week long enough to interrupt Vance Bell, assistant managing editor, elbow-deep in the *Guide for Stainless Steel Buyers* he's been compiling for the past ten months.

You can see pride of authorship light up Vance's eyes when he talks about "his project".

"It's never been done before," he says, "and it should be one of the most helpful services we've ever provided our readers."

Sounds like it, too. Just imagine . . . all stainless steel sizes . . . who produces them . . . where they can be purchased . . . all in one compact, easy-to-use reference guide.

"Tentative publishing date," says Vance, "is May 18."

Chatting with Vance Bell is a refreshing experience. He's the kind of guy you're glad is on your side, gives you the feeling that you're on a winning team.

You know his work. He writes the *Market Outlook* in STEEL each week and that, incidentally, is the "most quoted" business paper column in the United States today. Vance is also the author of the *Guide for Steel Buyers* published in STEEL in 1950, the *Metalworking Facts and Figures* sections which appear in STEEL's Yearbook issues each year and, of course, you've read and used his annual *Financial Analysis of the Steel Industry*.

If you catch him in a reminiscent mood, Vance will tell you that after attending Ohio State University, he broke into the newspaper and magazine publishing field as a two-dollar-a-week cub reporter on the Delaware (Ohio) Gazette twenty years ago. His boss was a young, whip-cracking, cigar-chewing city editor named Walt Campbell . . . the same whip-cracking, cigar-chewing Walt Campbell who is STEEL's Managing Editor today.

To relax, Vance dabbles in oils . . . likes to putter, too. Mrs. Bell, daughter JoAnn and son Charles like his lamp-building efforts best.

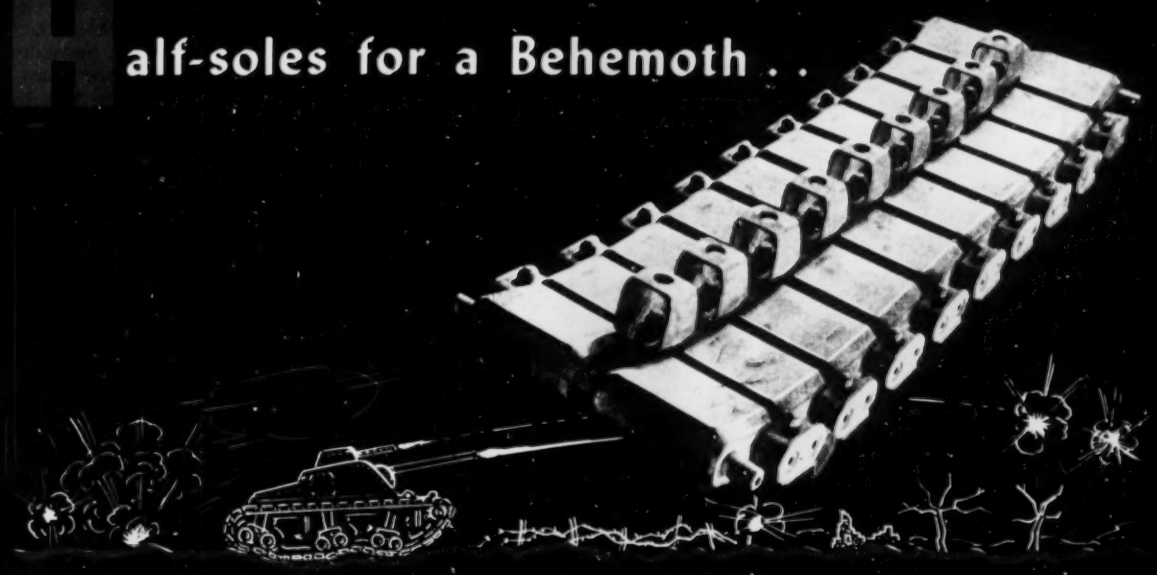
Just Call Me Bill

Part of our regular reading diet is *Printers' Ink*, the weekly advertising magazine, which has been published for yars and yars. In perusing it the other day we noticed a Horace Greeley on the masthead as one of their hardworking editors and our curiosity got the best of us. We just had to write Mr. G. and ask if he were or weren't related to *the* Horace Greeley, who handed out such excellent advice. Well, believe it or not, he is. The *New York Tribune's* editor was his great, great grandfather's cousin and young Horace claims his own father had a sense of humor in tagging him with the famous name, but that the joke is now getting a little stale. As a matter of fact, in defiance of the old boy's advice, he came east and insists he has no advice for young men. To make it even worse he now goes by his middle name of Bid.

Shrdlu

(Metalworking Outlook—Page 37)

Half-soles for a Behemoth . .



SHARON* HI-STRENGTH STEELS DELIVER MAXIMUM STRENGTH FOR TANK TRACKS

Tank parts must absorb a lot of punishment. Rough terrain, twisting directional turns, cannon recoil, quick starts and stops are a few of the reasons why modern tanks must take it.

To overcome failure through metal fatigue designers today are specifying that most parts of this vital mechanism be constructed of hi-strength steels. As a leader in the production of such special alloys Sharon has had a large part in the production of hi-strength steels for military purposes.

These same Sharon hi-strength steels are becoming increasingly available for product improvement for civilian consumption. If you're in the market for tough steels that will do more, talk to the Sharon man in your area.

***Specialists in STAINLESS, ALLOY, COLD ROLLED and COATED Strip Steels.**

SHARON STEEL CORPORATION

Sharon, Pennsylvania

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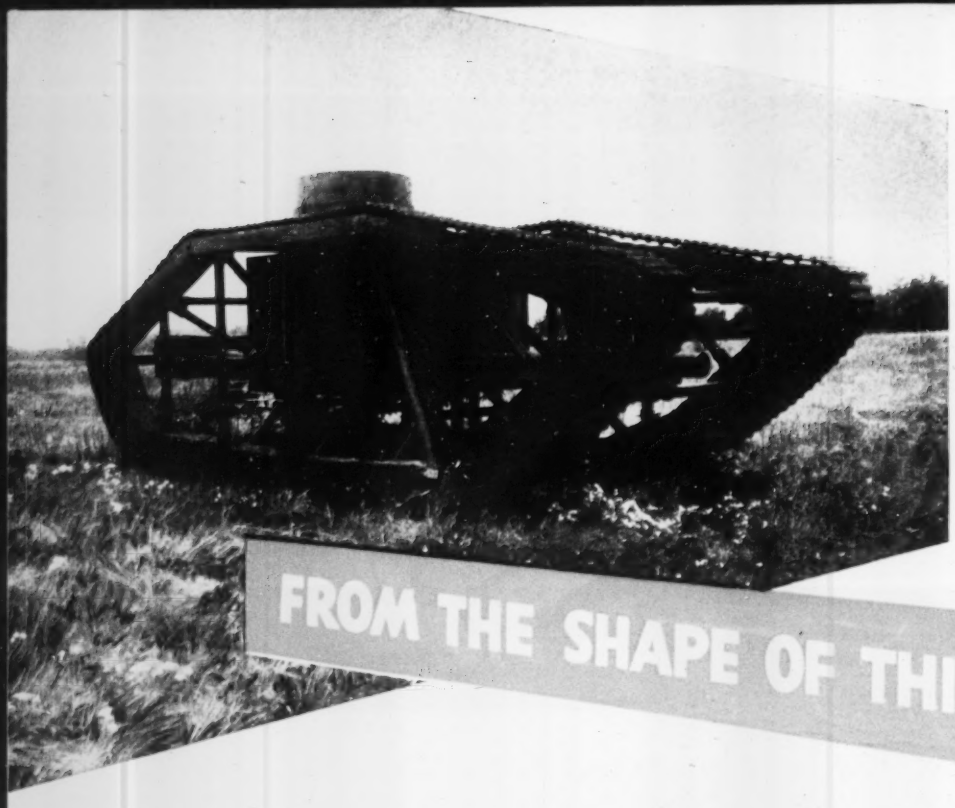
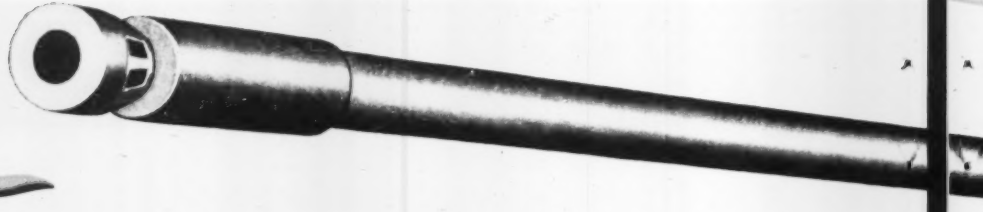
For information on Titanium contact Mallory-Sharon Titanium Corp., Niles, Ohio

SHARONSTEEL



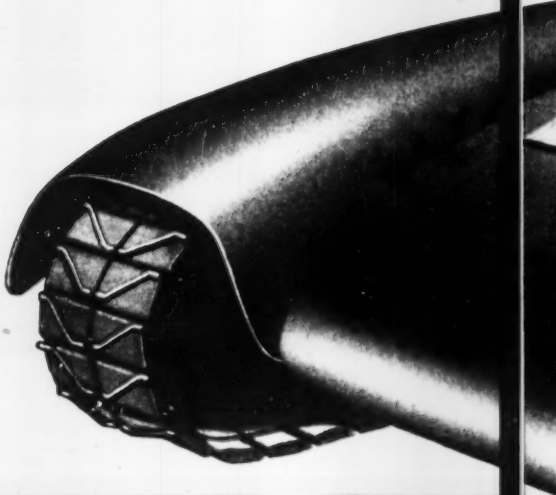
This skeleton tank was produced in 1918. It was built with the view of securing a light vehicle capable of crossing wide trenches. Many structural members were pieces of iron pipe with plumbing connections. The skeleton tank was powered with two 4-cylinder water cooled engines having a combined horsepower of 100. The unit weighed 8 tons and had a maximum speed of 5 mph. The driver sat in the front and in the rear was a gunner manning a 0.30 caliber machine gun.

FROM THE SHAPE OF THINGS PAST



ARMOR PLATE — *for Ordnance*

Every production facility for armor plate, ready to assemble in gauges from ¼" to 4" inclusive



Standard Steel Spring Company

ARMOR PLATE DIVISION • PENOBSCOT BLDG. • DETROIT, MICHIGAN

Standard Steel Spring Company

ALWAYS A GUIDING FORCE IN TANK PRODUCTION

Throughout the entire evolution of tank development Standard Steel Spring Company has lent a guiding hand in the design and production of a multitude of armored components. Today, our broad engineering and manufacturing experience is working at its highest skill producing a heavy tonnage of flat, formed, fully machined armor plate for tank fabricators. We tool these parts for their most economical production and work in the closest cooperation with procurement, production and inspection.

If you have a need for armor plate or are interested in a redesign program for greater efficiency and economy turn to us. You'll find that Standard Steel Spring Company—America's largest producer—is your best source for specially designed armor plate to meet your specialized individual needs.

Artist's conception of a long, low and streamlined tank of the future. The spherical contours of the armor plate minimize the effects of enemy fire power.

FLEXIBLE CONTROLS

made with

KEYSTONE
GALVANIZED MB
SPRING WIRE

- Uniform Tensile
- Corrosion resistant
- Extra strength

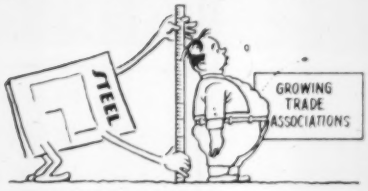
Leading makers of flexible control cables specify Keystone Galvanized MB Spring Wire for uniform coiling, improved corrosion resistance and extra strength. The outstanding quality of this wire is governed by Keystone's unique method of *galvanizing the wire before it is cold-drawn.* The drawing process smooths and hardens the galvanized finish — improves its lasting qualities. Keystone Galvanized MB Spring Wire is also furnished in Type 2 and Type 3 heavy weight zinc coatings before drawing to meet specified salt-spray tests.

INDUSTRIAL WIRE SPECIALISTS

Keystone Steel & Wire Company
PEORIA 7, ILLINOIS

LETTERS
TO THE EDITORS

Grow with Your Association



I plan to give your excellent trade association article "Trade Associations—How To Grow with Them" (Mar. 9, p. 76) wide distribution in our membership. Can we obtain the 450 reprints necessary to do the job?

J. C. Sears
executive secretary
American Gear Mfrs. Association
Pittsburgh

We would like to get 500 reprints . . .

Kenneth Andersen
Scientific Apparatus Makers Association
Chicago

Please send us 200 reprints . . .

H. S. Langland
president
National Association of
Architectural Metal Mfrs.
Minneapolis

Send 1500 . . .

Revel W. Elton
American Trade Association Executives
Washington

Send 50 . . .

Steel Shipping Container Institute
500 Fifth Avenue
New York

Send 4000 . . .

M. Ballinger
National Screw Machine Products Association
Cleveland

Send 2000 . . .

E. C. Barringer
executive vice president
Institute of Scrap Iron & Steel
Washington

• *Reprints of this article are still available from* STEEL*'s Reprint Department. —ED.*

Pumping for Information

It is our intention to survey the pump industry as to the types of pumps produced, number of manufacturers and sales for the industry. As you know, the latest census data are approximately five years old and apparently are the only source of information.

I have used surveys in the past conducted by trade publications and wonder whether your organization has any data on the pump industry, including air compressors.

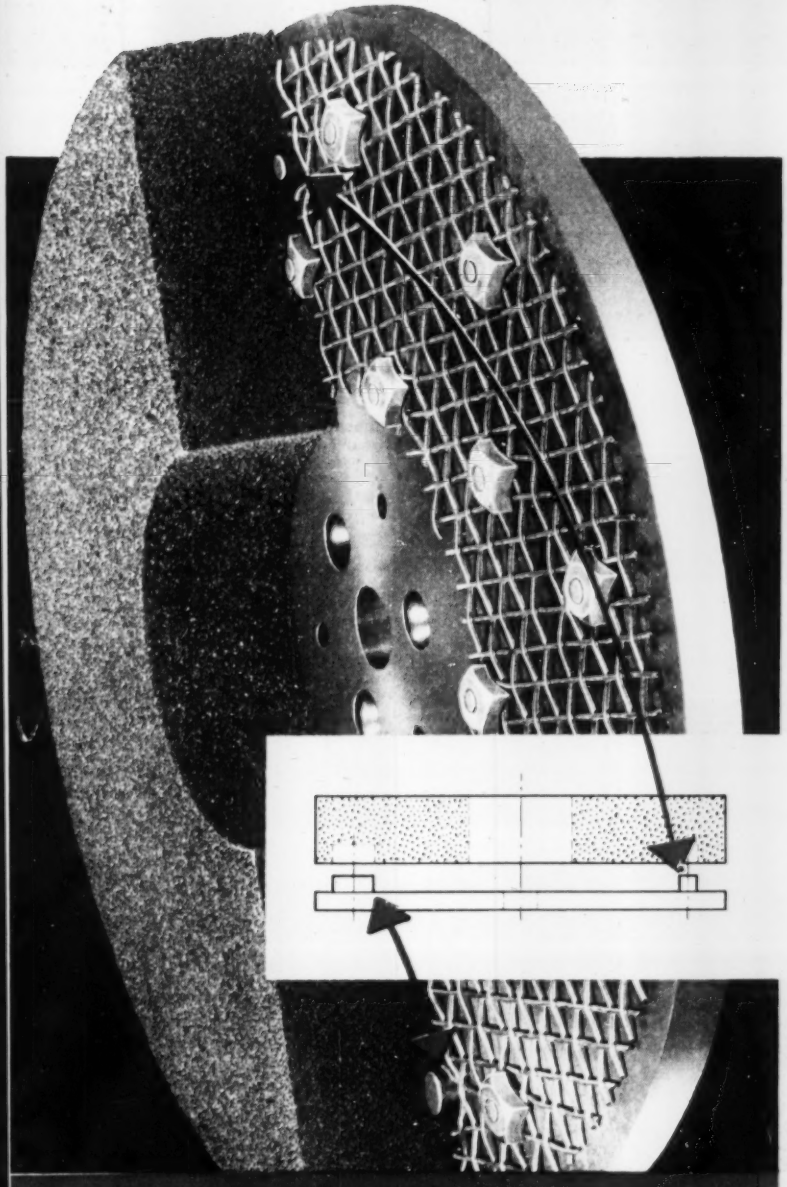
S. D. Chirsan, manager
Market Research Unit
Westinghouse Air Brake Co.
Wilmerding, Pa.

• *About 350 companies in the U. S. produce pumps, compressors and related equipment. In 1951, sales of all pumps, except turbine classification, were at the rate of $6.8 million a month. That's well above the 1950 monthly average of $4.5 million. Monthly sales of compressors in 1951 averaged $5.9 million for the classification which includes stationary compressors of a wide variety, com-*

Continued on following page

Compare the Grinding Precision

of This Abrasive Disc With Other Makes



Grinding to close tolerances is no problem with Gardner abrasives. Precision work is made easier because factory trueness is maintained throughout the entire life of the disc.

On Gardner discs provided with the Tru-Lok feature, it's impossible to make an off center mounting. On job after job maintaining trueness assures better finishes and closer tolerances. Doweled Tru-Lok mounting aligns the holes in the abrasive and the steel wheel.

This exclusive Gardner feature is another reason why Gardner Abrasive Discs are first choice among users of flat surface grinders. New Gardner grinders are equipped with the Tru-Lok feature. It can also be made available for older machines.

Gardner engineers abrasive discs to fit specific grinding requirements. For help with your surface grinding problems, call the nearest representative in our nation-wide service organization.

GARDNER

abrasive discs

Technical Publicity Division
GARDNER MACHINE COMPANY
Beloit, Wisconsin

Please send me the Gardner Guidebook for Surface Grinding.

NAME _____

TITLE _____

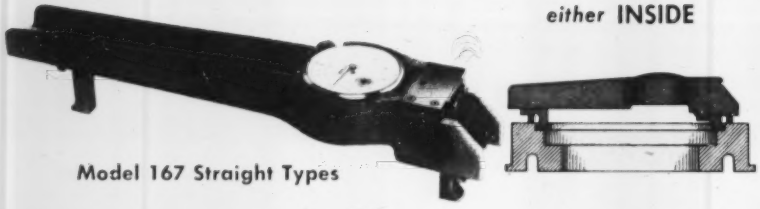
COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

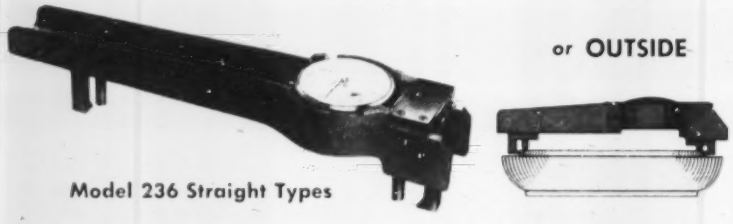
Here's the Answer for Inspecting SHALLOW DIAMETERS

either INSIDE

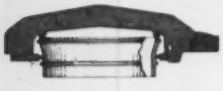


Model 167 Straight Types

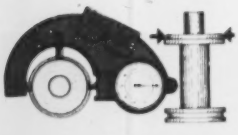
or OUTSIDE



Model 236 Straight Types



Humped Types
Inside or Outside



"C" Types
Inside or Outside

Checking the accuracy of a diameter on a shallow shoulder or similar section is often a problem, especially if the diameter is large in comparison with the surface being measured. (See sketches). With these Shallow Diameter Gages, however, it's easy to get fast, accurate checks.

"Locating" contact points help to position the gage parallel to the flat surfaces of the workpiece so the actual diameter is read perpendicular to the axis of the workpiece. Both inside and outside diameters, and diameters at various depths, are checked positively and accurately.

For checking workpieces having projections which would interfere with Straight Type Gages, the Humped Types are recommended. For measuring similar dimensions remotely located from either end of the workpiece "C" Type Gages are the answer. Let us know your requirements. Federal Products Corporation, Providence 1, R. I.

FEDERAL

Largest manufacturer devoted exclusively to designing and manufacturing all types of DIMENSIONAL INDICATING GAGES

FEDERAL PRODUCTS CORPORATION · 1213B Eddy Street, Providence 1, R. I.

Please send me information about the following:

☐ Sketch ☐ Blueprint is enclosed showing dimension we wish to gage.

☐ Model 167 Straight Types ☐ Model 236 Straight Types ☐ Humped Types ☐ "C" Types

Name

Company

Street

City *State*

LETTERS

Concluded from preceding page

plete portables and rock drilling equipment. The monthly average for that compressor classification in 1950 was $2.7 million. Total sales figures are only estimated because of the diversity of the industry's production and because 250 plants in addition to the 350 mentioned above turn out the products as a minor activity.—ED.

Tops in Its Field

I rate STEEL magazine as number one. For my needs, it gives me all the information classified so I can find what I want quickly. When time is too short to turn all the pages, I know that by glancing first at the Outlook, then continuing through the editorial, and following 5 or 6 pages of news; then a fast turn to the Market Outlook, News and Metalworking Notes; and I'll have everything I NEED. I can't do that with any other metalworking publication.

So, place that feather among the others in your cap.

J. R. Pratt
owner
Hudson Steel Supply Co.
Providence, R. I.

A Job for Everyone

I have read with great interest your editorial in the Feb. 23 issue "P.R. Is Every Company's Job," together with the comprehensive article on public and community relations in the same issue.

Both the editorial and the article are most constructive and should be a real stimulant in furthering a better community and public relations job by industry.

John W. Hill
Hill & Knowlton Inc.
New York City

Congratulations on your most excellent primer on community and public relations.

V. R. Hassler
3116 2nd Road N.
Arlington, Va.

Will you please send me five copies . . .

B. W. Lang
vice president
AP Parts Corp.
Toledo, O.

Pattern of Street Distribution

Can you recommend a source for figures on the distribution of steel by either trading areas; state or counties, broken down into the divisions used by the American Iron & Steel Institute?

E. P. Easley
secretary
E. L. Easley Machinery Co.
Chicago

• *There are no up-to-date figures on distribution of steel geographically. The 1947 Census of Manufacturers has section titled "Geographic Distribution and Consumption of Metal Mill Shapes and Forms and Castings: 1947" which you may obtain from the Commerce department or Census Bureau. Ask for report series number MC100-10.—ED.*

How to "wrap up" *improved production*

● If your production involves the application or forming of wire, consider this . . .

Because specialists at National-Standard's Worcester Wire Works probe *deep* into the development and behavior of special-purpose wires, they're often able to suggest modifications that boost production plenty! Sometimes, for example, it's a modification that eliminates machine jamming and down-time. It might be a new or different finish that permits increased production speeds. Or, as often happens, it's an idea that gets the job done with *less* wire or other materials.

You can always count on Worcester Wire Works for service that goes further than usual — for special development help if you want it. And, in any case, you'll find in your National-Standard wire the uniformity, the adherence to specifications that in itself saves time and dollars!

NS NATIONAL-STANDARD Company NILES, MICHIGAN

DIVISIONS OF NATIONAL-STANDARD CO.

ATHENIA STEEL.. *Clifton, N. J.*	Flat, High Carbon, Cold Rolled Spring Steel
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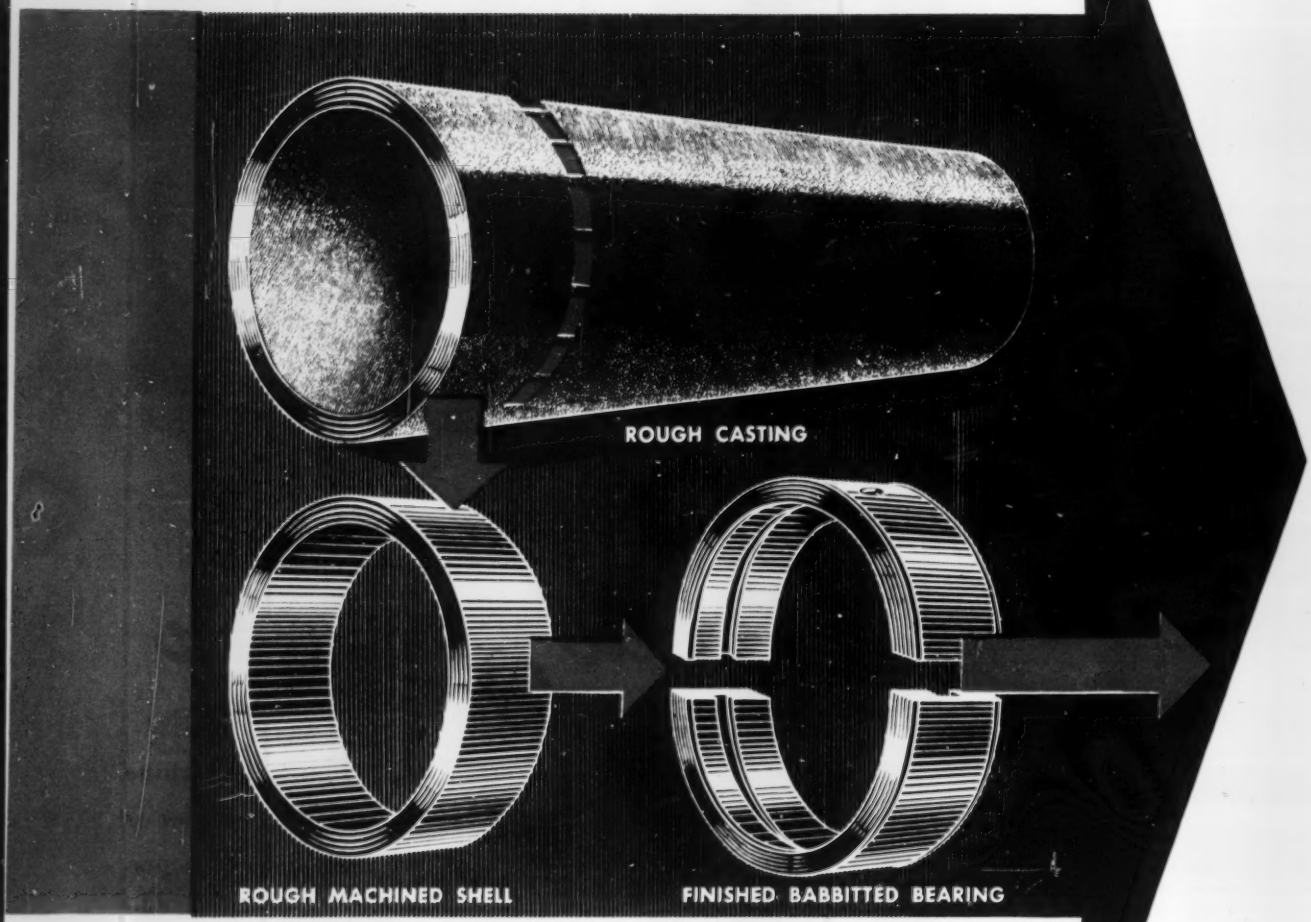
REYNOLDS WIRE.. *Dixon, Illinois*	Industrial Wire Cloth
WAGNER LITHO MACHINERY.. *Jersey City, N. J.*	Metal Decorating Equipment
WORCESTER WIRE WORKS.. *Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes

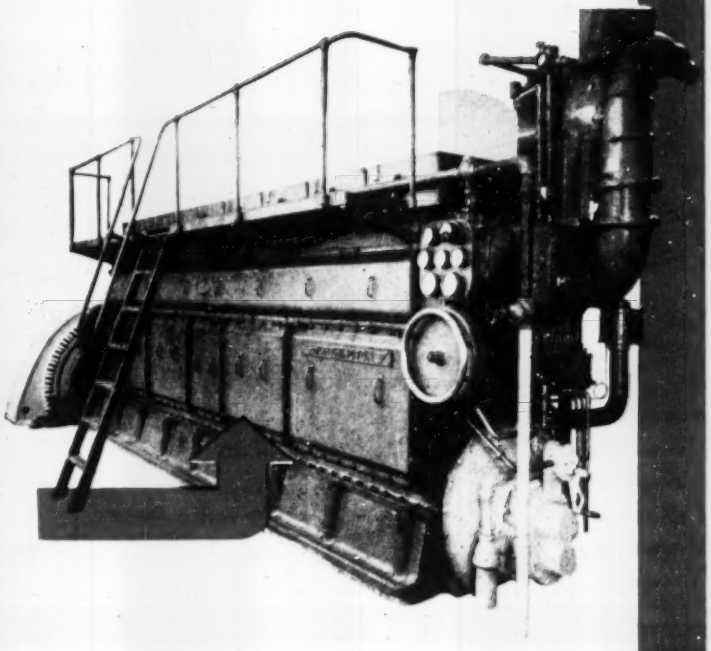
ROUGH··· RIGHT AND



TYPES OF METAL CAST: Stainless Steel—All AISI Types, plus special heat and corrosion resistant analyses. • Alloy Steel—all grades • Carbon Steel—all grades • Gray and Alloy Iron—all standard and special analyses, including Ni-Hard and Ni-Resist • "Dual Metal"—Gray or alloy iron inside steel; gray iron inside chilled iron and tool steel; iron or steel inside stainless; and many other metallurgically bonded two-metal centrifugally cast combinations.

SIZE RANGE: Outside diameters—2½" through 30" • Wall Thickness—¼" to 4" • Lengths—Up to 14'.

READY



WORTHINGTON'S *popular Heavy Duty Supercharged 16 x 20 Diesel Engine is equipped with centrifugally cast bearing backs supplied "as cast" for finishing by Worthington to its own specifications.*

IN ROUGH FORM... "as cast"... ready for other specialists to fabricate or to finish — that's how we supply castings to a growing list of America's quality-minded industries.

These bearing backs, for example: Worthington Corporation uses them in their entire line of Heavy Duty Supercharged Oil, Gas and Dual Fuel Diesel Engines. We furnish the rough castings in random lengths up to 10 feet. Worthington finishes them—machines, tins and babbitts to their own specifications.

The result is a bearing shell with the following distinct advantages:

1. Metal mold centrifugally cast gray iron has high tensile strength and uniform grain structure highly satisfactory for tinning and babbitting the bearing face.
2. This soundness provides for uniformity of bond. Minimum babbitt thickness assures efficient operation, maximum bearing life.
3. Rough castings are annealed dead soft allowing maximum machining speeds and feeds for iron — keeping machining cost to a minimum.
4. The annealed gray iron centrifugally cast bearing back stock properly machined will not spring out of shape when split to make bearing halves.
5. In the event of babbitt failure, the cast iron back won't injure the journals of the crankshaft.
6. Losses incurred in finishing are held to a minimum.

Like to know whether metal mold centrifugally cast iron, steel and stainless steel is the answer to your particular problem? Write and outline your tubular product requirements today. Our engineers will gladly forward the facts.

UNITED STATES PIPE & FOUNDRY CO.

SPECIAL PRODUCTS DIVISION USP

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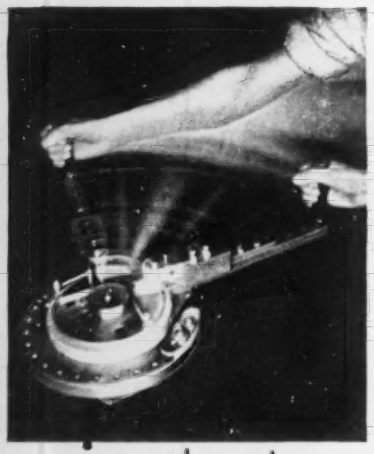

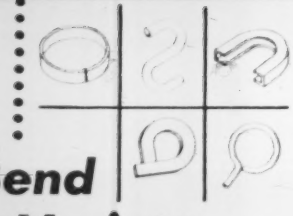

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*Pronounced Die ack ro

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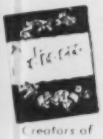

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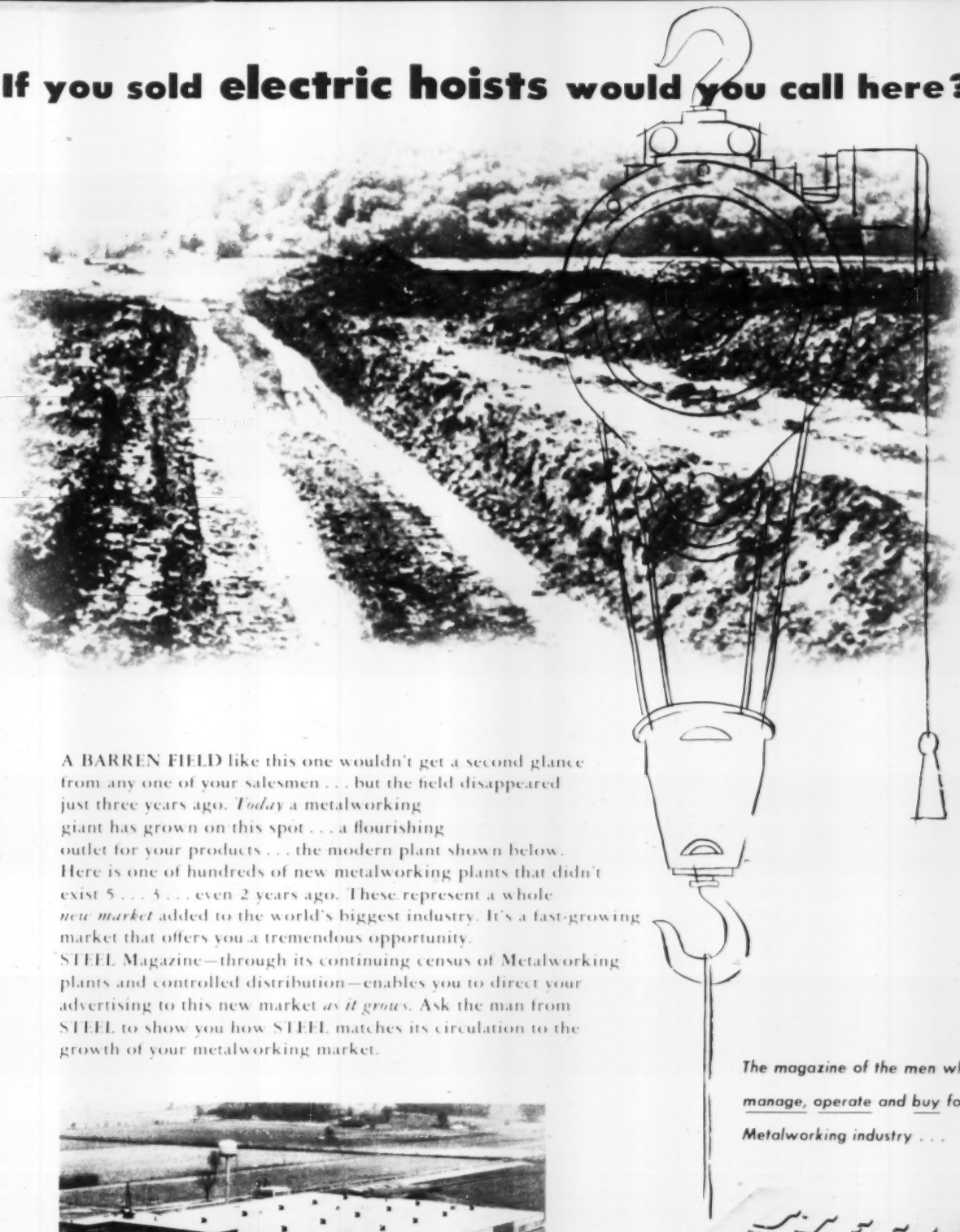
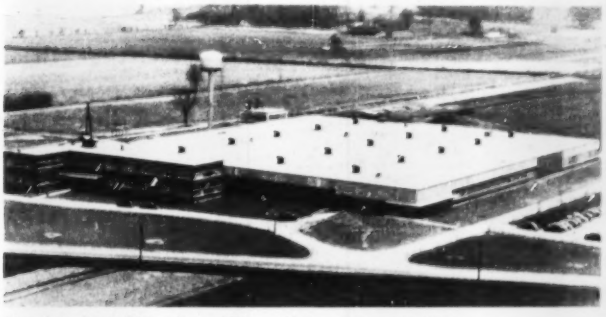


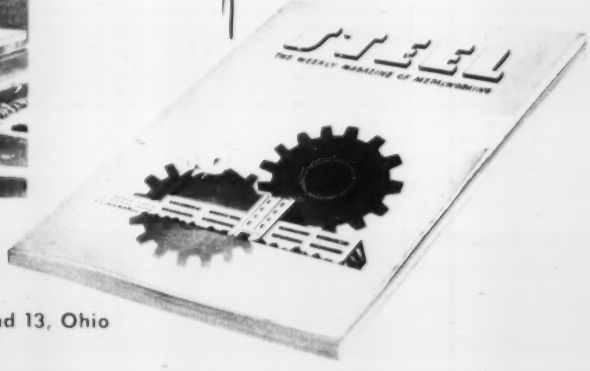
A BARREN FIELD like this one wouldn't get a second glance from any one of your salesmen . . . but the field disappeared just three years ago. *Today* a metalworking giant has grown on this spot . . . a flourishing outlet for your products . . . the modern plant shown below. Here is one of hundreds of new metalworking plants that didn't exist 5 . . . 3 . . . even 2 years ago. These represent a whole *new market* added to the world's biggest industry. It's a fast-growing market that offers you a tremendous opportunity.

STEEL Magazine—through its continuing census of Metalworking plants and controlled distribution—enables you to direct your advertising to this new market *as it grows*. Ask the man from STEEL to show you how STEEL matches its circulation to the growth of your metalworking market.



New Lancaster, Ohio, plant of Diamond Power Specialty Corp.

The magazine of the men who manage, operate and buy for the Metalworking industry . . .



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Look at the *contact* between the balls and the deep, continuous groove in each ring of this bearing—contact that enables it to sustain not only radial load, but substantial thrust load, even at very high speeds.

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Many bearings are serving industry everywhere because 's unmatched Field and Home Office engineering service helped product designers *put the right bearing in the right place.* **SKF INDUSTRIES, INC.,** PHILADELPHIA 32, PA.
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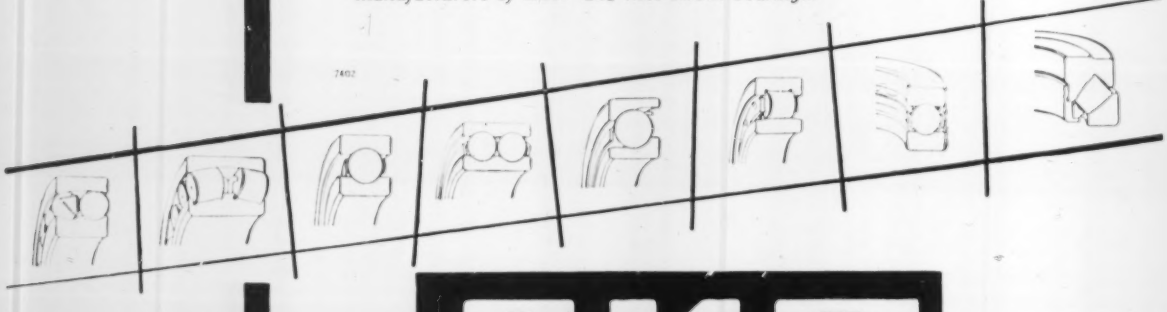

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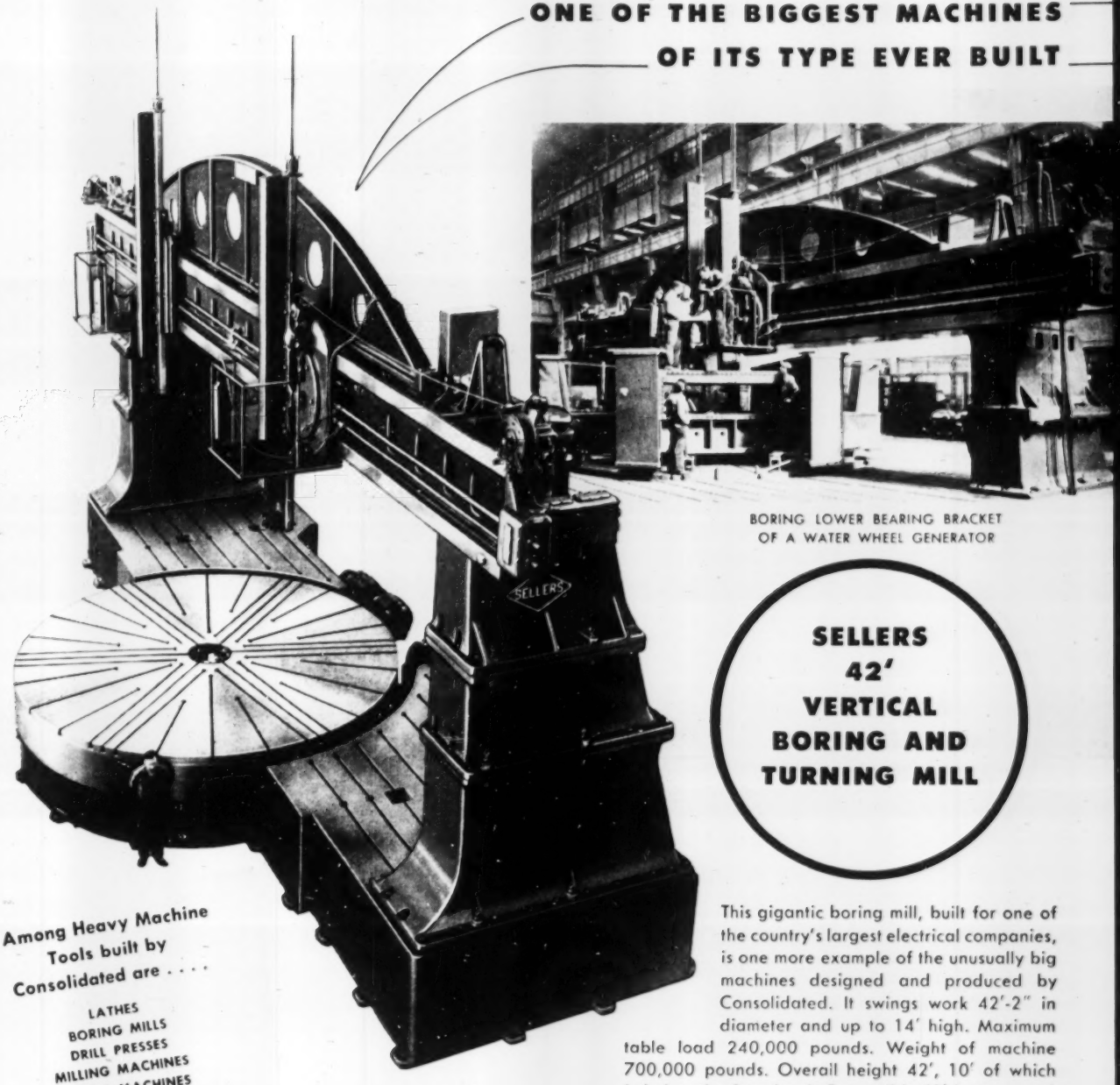

BORING LOWER BEARING BRACKET OF A WATER WHEEL GENERATOR

SELLERS 42′ VERTICAL BORING AND TURNING MILL

This gigantic boring mill, built for one of the country's largest electrical companies, is one more example of the unusually big machines designed and produced by Consolidated. It swings work 42′-2″ in diameter and up to 14′ high. Maximum table load 240,000 pounds. Weight of machine 700,000 pounds. Overall height 42′, 10′ of which is below the floor level. Crossrail is 58′ long.

Other huge Consolidated Machines, recently built or in process, include a Betts Special Boring and Facing Machine, weighing 300,000 pounds, and a Sellers Combination Planer-Milling Machine, weight over 645,000 pounds; together with Betts-Bridgeford 96″ Geared Head Lathes, Sellers Horizontal Boring, Drilling and Milling Machines and Hilles & Jones Plate Edge Planers weighing 250,000, 275,000 and 120,000 pounds respectively. Whether your production problems demand big or standard type machines, Consolidated is prepared to meet your requirements.

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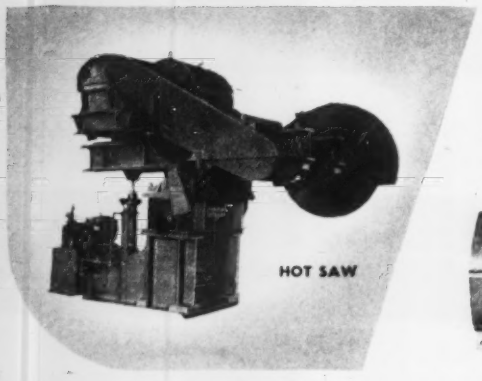
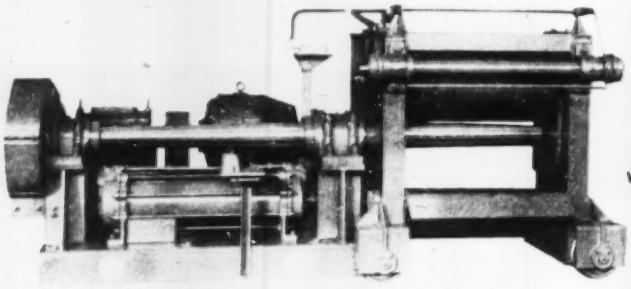


HOT SAW



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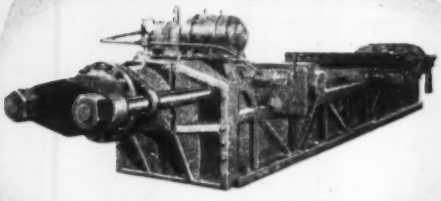
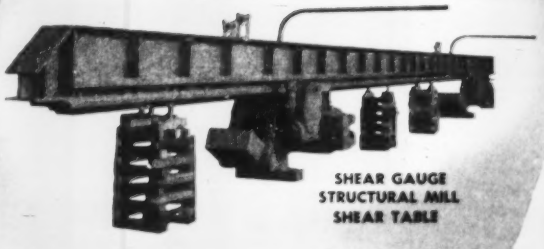
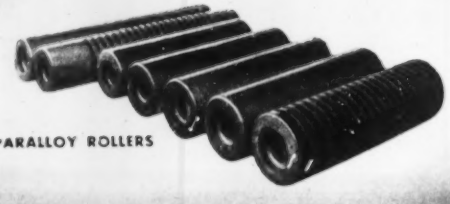


800,000# STRETCHER LEVELER



SHEAR GAUGE STRUCTURAL MILL SHEAR TABLE



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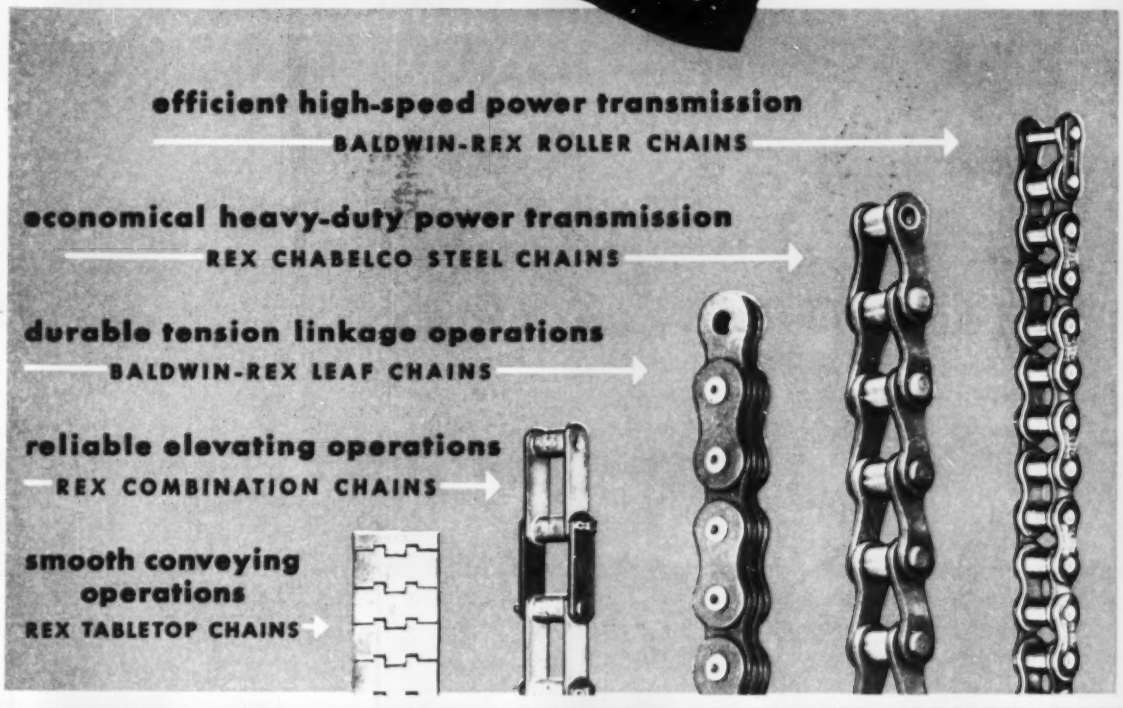

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☐ Slide rule drive selector for slow to medium speeds.

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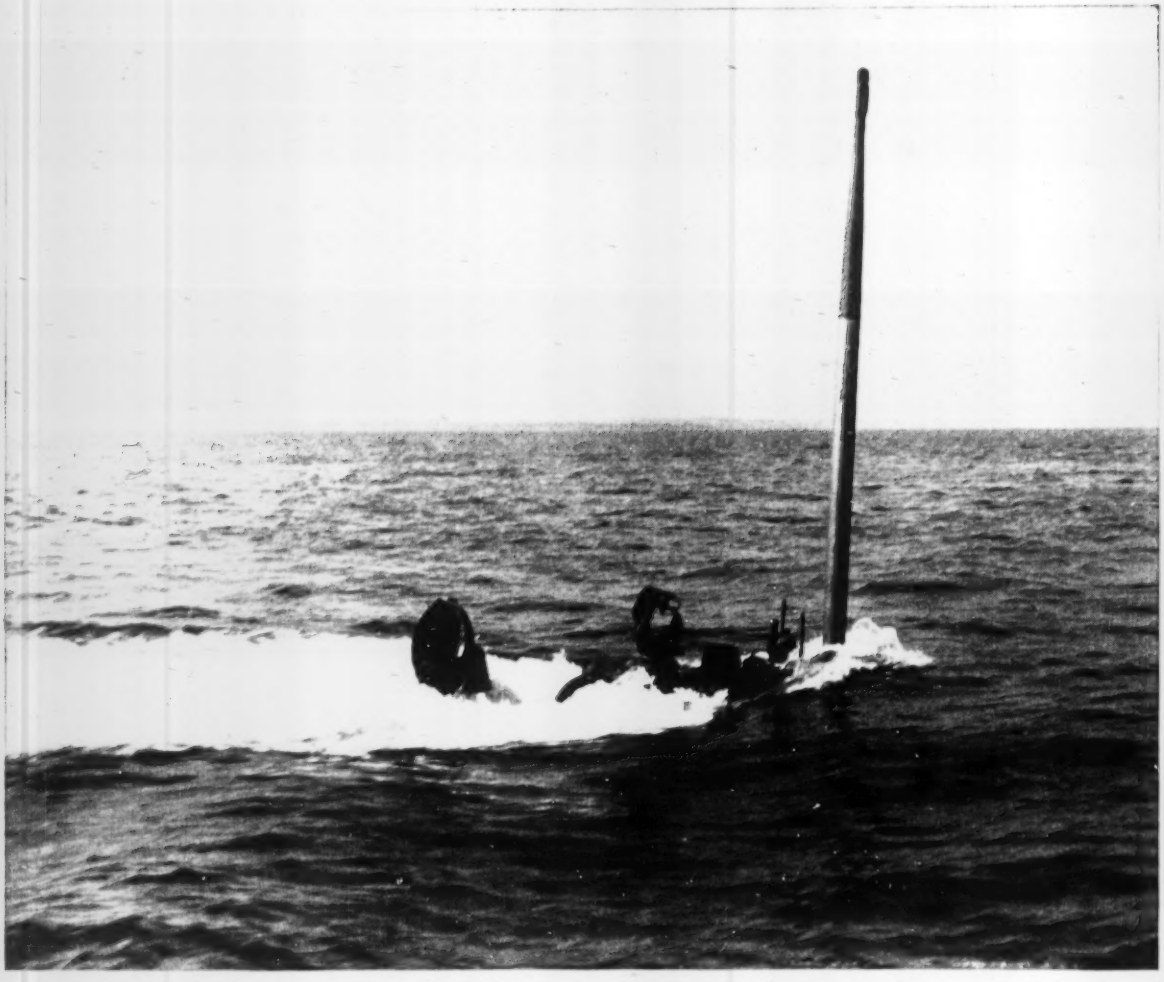

—and there's much more to it than appears on the surface

Only a stainless steel periscope tube, and some special navigational apparatus, shows above water. But below, a wonderfully compact mass of fighting machinery—literally packed with special steels and electrical alloys. *With* them, the ship is almost human. *Without* them, it has no eyes, ears, power . . . or usefulness. ● When *you* have to combat corrosion, heat, wear or great stress—or require unique electrical properties—check with us. ***Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.***

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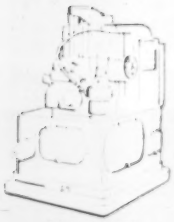
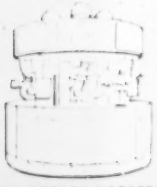
LEADING PRODUCER HIGH-ALLOY STEELS

PIONEERING on the Horizons of Steel

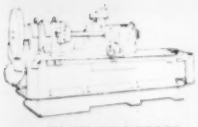
Allegheny Ludlum



12-S HOBBER

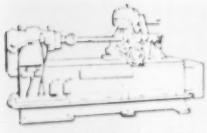


7-A ROTARY HOBBERS

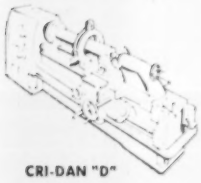


SH SPLINE HOBBER

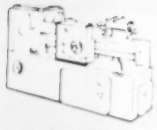
MODEL 40 THREAD MILLER



HT THREAD MILLER



CRI-DAN "D"



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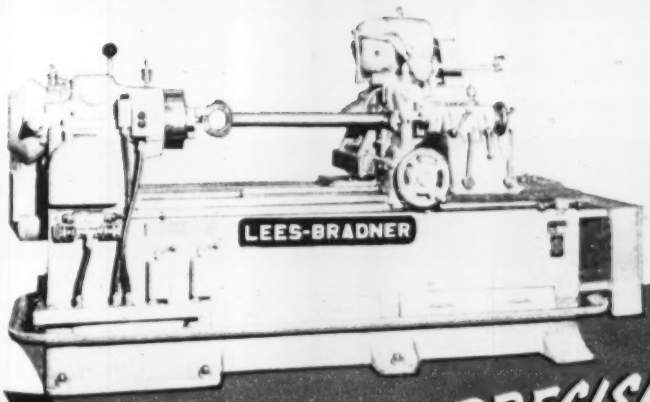


RUGGED PRECISION

of the Lees-Bradner Model HT Thread Miller

HELPS PRODUCE

RUGGED POWER

for Caterpillar

It's not surprising that Caterpillar should select the Lees-Bradner HT Thread Miller to help produce the famous line of Caterpillar earthmoving equipment. They have a lot in common.

Both are extra rugged and unusually versatile. Both are built for long, efficient service and both are leaders in their respective fields.

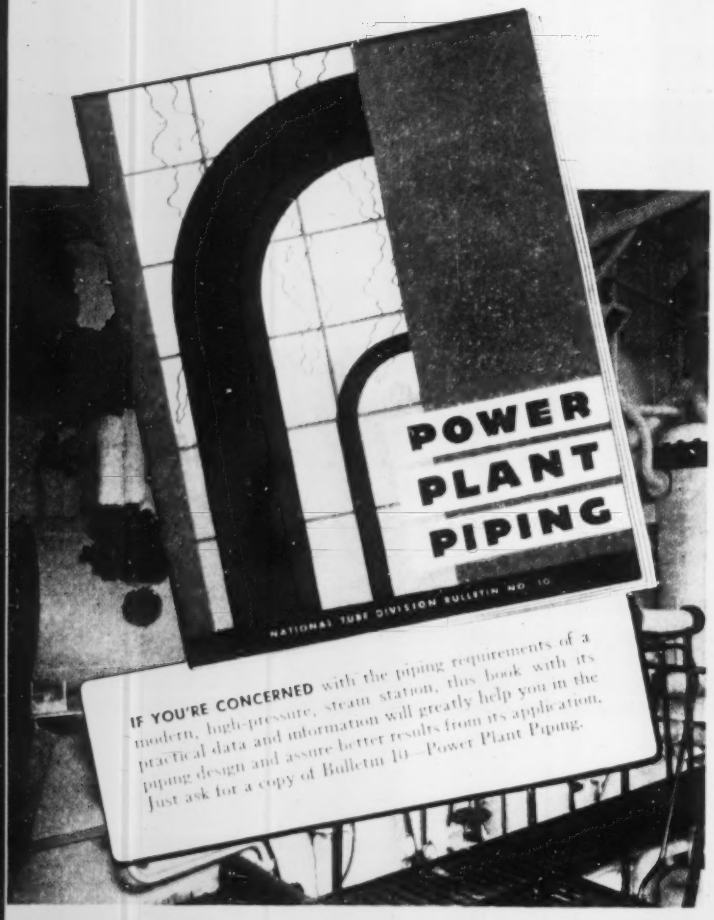
No matter what the threading job, chances are the Lees-Bradner HT Thread Miller can meet your requirements—for accuracy, speed and the wide range of work it can accommodate.

Call your Lees-Bradner representative for the whole story on the HT Thread Miller—or write us direct.

the LEES-BRADNER Company

CLEVELAND 11, OHIO, U.S.A.

Here's why NATIONAL *Seamless* handle today's higher

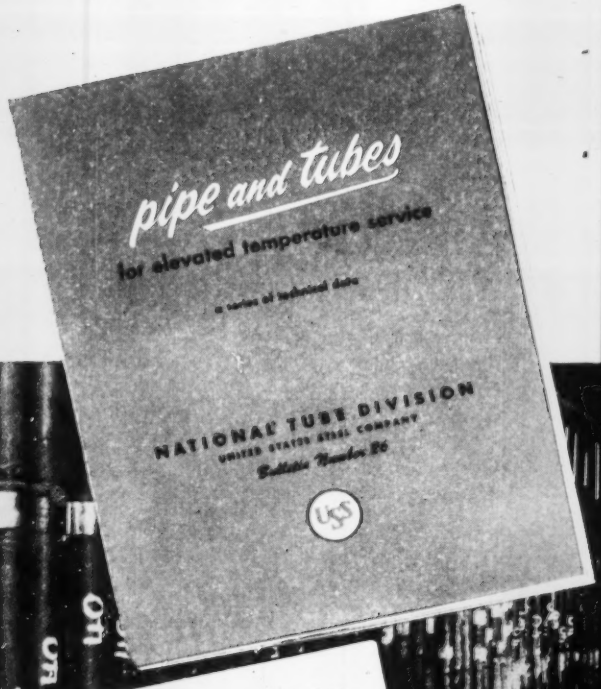


THE equipment you use today must meet demands far more severe than those of only a few years ago. That's because stepped up operations, in industrial processing of all kinds and in the more efficient production of steam and power, are continually calling for higher temperatures and pressures.

In the face of these increasingly more difficult conditions it is comforting to know that insofar as pipe and tubes are concerned *all* your needs can be met economically and efficiently by NATIONAL Seamless Pipe and Tubes.

For not only do these famous "Walls without Welds"—pierced from solid billets of steel—provide the unsurpassed safety and dependability of a solid steel forging, but they are produced in a complete range of steel analyses from low carbon to the finest alloy and stainless steels.

IF YOU'RE CONCERNED with the piping requirements of a modern, high-pressure, steam station, this book with its practical data and information will greatly help you in the piping design and assure better results from its application. Just ask for a copy of Bulletin 10—Power Plant Piping.



IN THIS RECENTLY PUBLISHED BULLETIN 26, you will find a complete and authoritative guide to the selection of the right analysis of pipe and tubing for handling elevated temperatures. The technical data covers 26 different steel analyses representing a wide variety of chemical compositions that are of special interest to users of tubular products who are concerned primarily with elevated temperature properties. Send for your copy.

PIPE and TUBES will help you temperatures and pressures

What is more, NATIONAL Seamless Pipe and Tubes, old in name and rich in service, have never been allowed to rest on past performance. Through the years they have continually been improved . . . not merely to meet industry's more and more drastic demands but always to anticipate them.

That is why, no matter how severe or unusual your pipe or tube problem—whether it involves extremes of heat or pressure, corrosion, oxidation, exposure, or any combination of destructive conditions—more than likely one of our many analyses of NATIONAL Seamless will provide a solution, reasonable in cost and dependable in service.

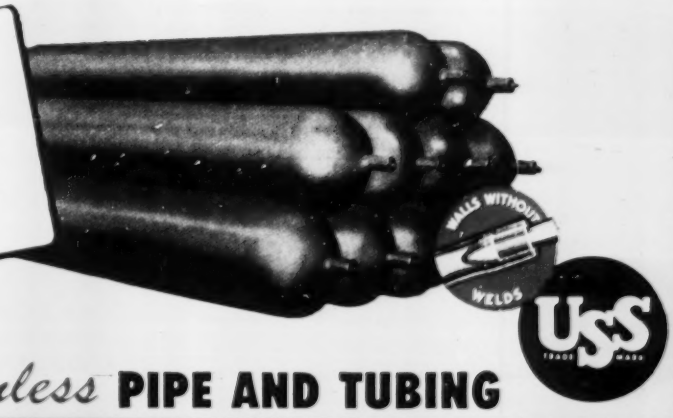
NATIONAL TUBE DIVISION
UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.

COLUMBIA GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

NATIONAL SEAMLESS CONDENSER AND HEAT EXCHANGER TUBES are recognized everywhere as the finest tubes that modern metallurgy can produce. They are furnished in a number of analyses to meet the different requirements of modern heat transfer applications. We invite you to bring your problems to NATIONAL. Our tubing specialists will work closely with your own engineers to see that you get just the right tubes for your particular requirements.

By the largest manufacturer of tubular products in the world
NATIONAL Seamless STEEL BOTTLES for Gas Storage
NATIONAL TUBE DIVISION
PITTSBURGH, PA.

FOR SAFE, EFFICIENT, AND ECONOMICAL high pressure gas storage, you can't beat NATIONAL Seamless Steel Bottles. Manufactured from seamless steel pipe made by the famous "Walls without Welds" process and formed at both ends, necked and tapped to your specifications, these steel bottles offer the utmost in strength, safety and low maintenance. An inquiry will bring detailed information. Ask for Bulletin No. 25.



U·S·S NATIONAL *Seamless* PIPE AND TUBING

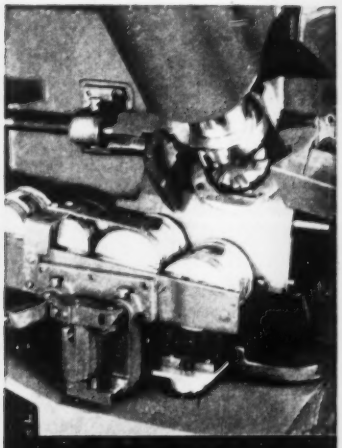
UNITED STATES STEEL

. . . untouched by human hands!

. . . to plus-or-minus .035 oz.!

. . . at 12 per minute rate!

pistons balanced automatically



. . . by this amazing new

Morris

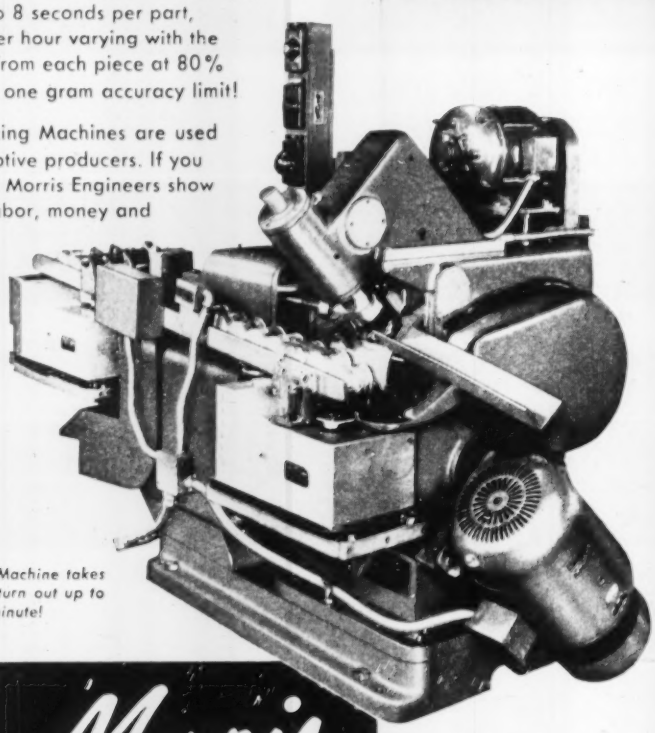
AUTOMATIC PISTON BALANCING MACHINE

For the first time, this MORRIS Mor-Speed Production Machine makes piston balancing 100% automatic. Parts are unloaded automatically from a standard conveyor, processed or rejected and returned to the conveyor "untouched by human hands."

Underweight or grossly overweight pistons are automatically rejected without interrupting the production flow. Depending on a cycle time ranging from 5 to 8 seconds per part, production is 450 to 720 parts per hour varying with the amount of metal to be removed from each piece at 80% efficiency and to a plus-or-minus one gram accuracy limit!

MORRIS Automatic Piston Balancing Machines are used by a number of the major automotive producers. If you have a piston production line, let Morris Engineers show you case history proof of time, labor, money and floor space savings.

Write today for NEW bulletin describing and illustrating the revolutionary MORRIS Piston Balancing Machine.



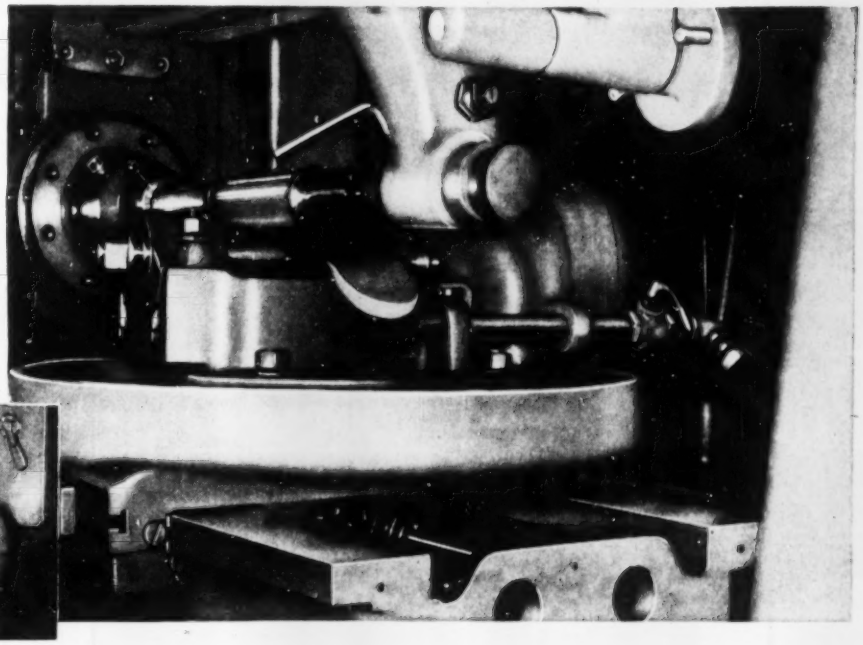
The Morris Automatic Piston Balancing Machine takes only 27.3 square feet of floor space to turn out up to 12 accurately balanced pistons every minute!

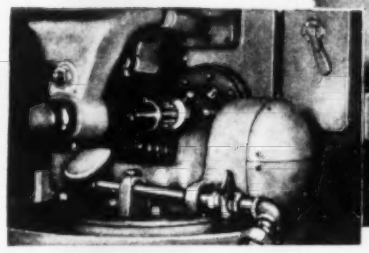
a better product at less cost with precision PLUS production

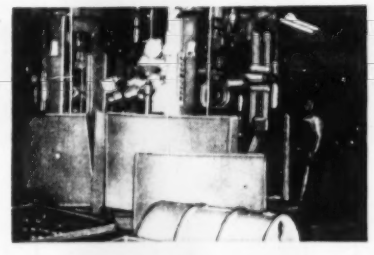
Builders of MOR-SPEED Line

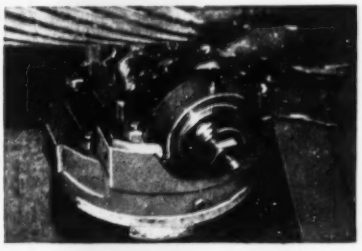
Morris

THE MORRIS MACHINE TOOL COMPANY, 941 HARRIET ST., CINCINNATI 3, OHIO









"ON-THE-JOB" CUTTING OIL TESTS BY CITIES SERVICE ENGINEERS!

at Timken-Detroit Axle Company

TOOL WEAR REDUCED 25%... MANUFACTURING COSTS ALSO CUT!

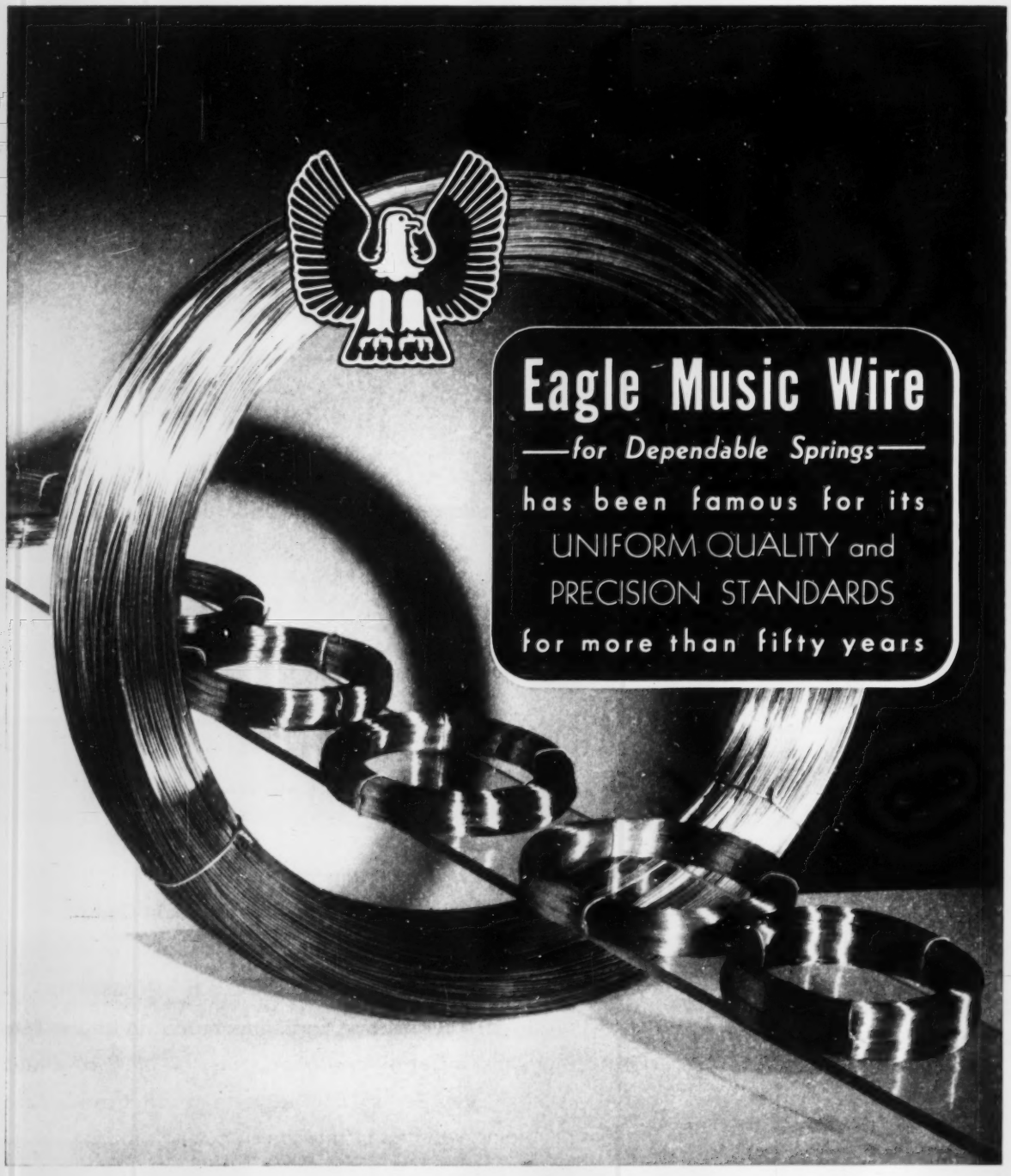
In an effort to reduce tool wear and cut manufacturing costs, the Wisconsin Division of Timken-Detroit Axle Company at Oshkosh called in Cities Service Engineers to make "on-the-job" tests.

Cities Service Lubrication Engineers made an on-the-spot study of the Timken-Detroit operation. This "on-the-job" evaluation by skilled Cities Service Engineers, long practiced in solving like problems, resulted in a recommendation for the use of a Chillo Cutting Oil that actually reduced tool wear 25% with proportionate savings in manufacturing costs!

WHAT ARE YOUR PROBLEMS? Why not take advantage of free, "on-the-job" testing? Call for our lubrication engineers at the office nearest you, or write Cities Service Oil Company, Dept. C18X, Sixty Wall Tower, New York City 5, New York.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS



WASHBURN WIRE COMPANY, NEW YORK CITY

WASHBURN

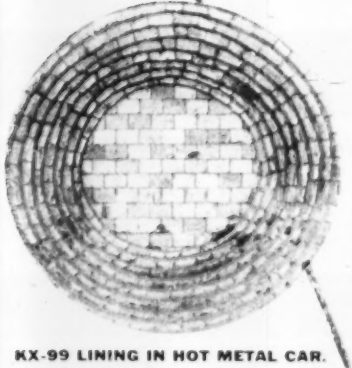
CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

A. P. GREEN KX-99

KX-99 firebrick linings in hot metal cars and hot metal mixers provide extra tonnage that means extra savings

The superior toughness and uniformity of KX-99 in hot metal car and hot metal mixer linings has provided such outstanding service records, many leading steel companies have standardized on their use.

The exceptional properties of KX-99 brick enable them to better withstand erosion and slag action. Uniformity of size permits laying up KX-99 with very thin joints to better withstand the scouring and washing action of molten metal.



KX-99 LINING IN HOT METAL CAR.

A. P. Green REFRACTORY PRODUCTS

SERVE THE WORLD'S INDUSTRIES

For detailed information on service and specific recommendations — contact your local A. P. Green Representative or write

A. P. GREEN FIRE BRICK COMPANY
MEXICO, MISSOURI

In Canada

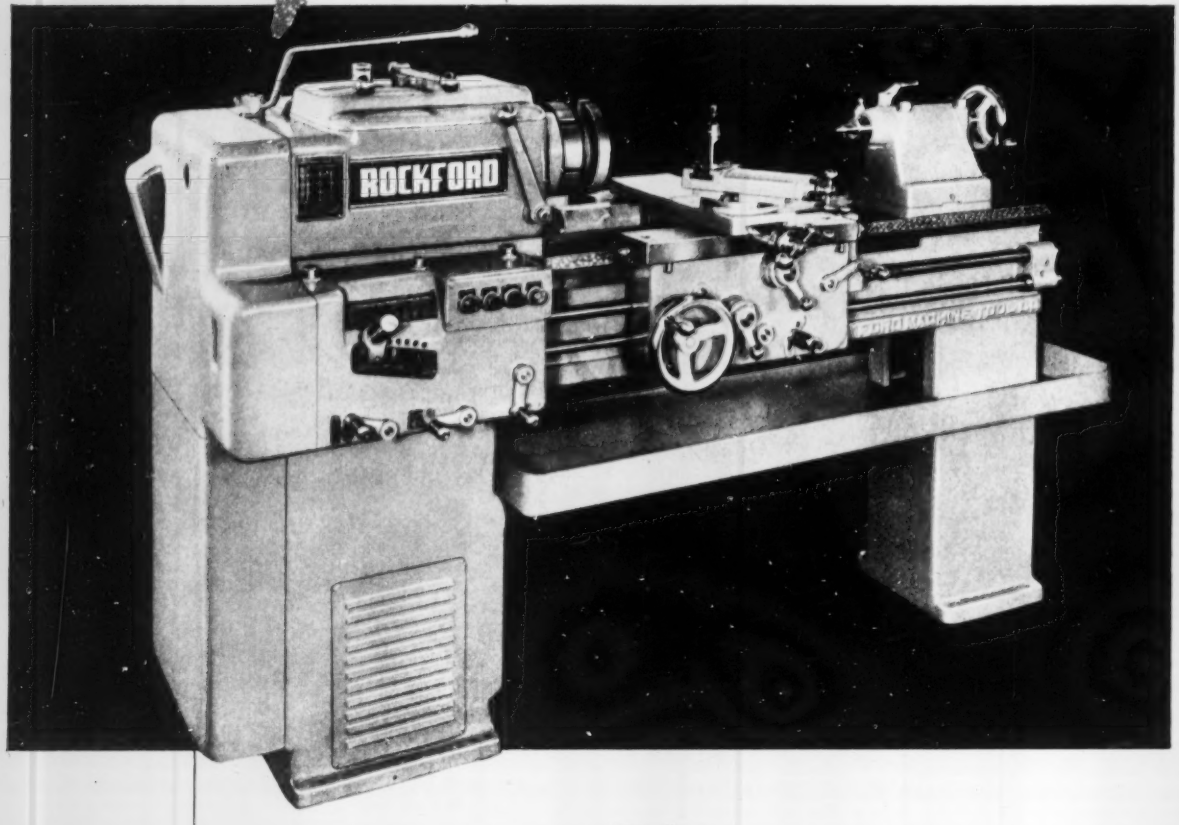
A. P. GREEN FIRE BRICK COMPANY, LTD.
TORONTO 15, ONTARIO

*Check List for

PRACTICAL LATHE TURNING

* BIG ACCURATE LEAD SCREW
INDEPENDENT FEED SHAFT
BIG PRECISION TIMKEN BEARING SPINDLE
HEAVY TAIL STOCK, ANTI-FRICTION THRUST BEARINGS
PRECISION HOBBED AND SHAVED HEADSTOCK GEARS
TOOL ROOM ACCURACY, ZERO PRECISION BEARINGS, PRODUCTION POWER, 5 H.P. DRIVE MOTOR
ALL GEARED HEAD, QUAD-V-BELT DRIVE
HEAVY CUTS, 16" OR 18" SWING, 30" CENTER DISTANCE
6' BED, DOUBLE-WALL APRON, 3100 LBS. TOTAL WEIGHT

either tool room or high production



Rockford Lathes offer you all of these production features, with modern design, ample dimensions and high quality materials.

Ask a Rockford Machine Tool Co. Representative to give you full details on the practical production advantages of these heavy service, medium sized, economy priced machines.

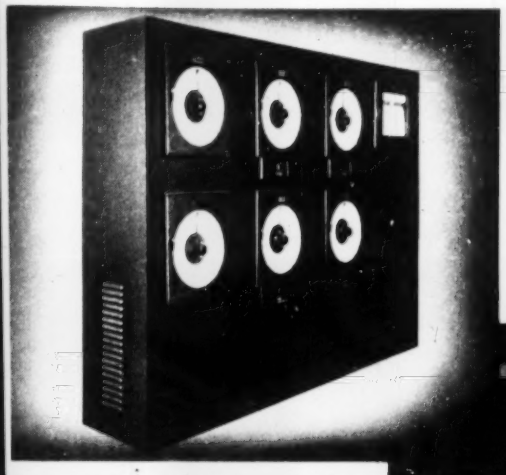
MEDIUM-SIZED
ECONOMY-PRICED

ROCKFORD ECONOMY LATHES—16" and 18"

ROCKFORD MACHINE TOOL CO.

2500 KISHWAUKEE STREET • ROCKFORD, ILLINOIS

Job-engineered instrumentation by Honeywell assures performance ... saves time



APPLICATION ENGINEERING
starts with cooperative discussion between customer and Honeywell engineering representatives . . . follows through to design and assembly of complete control systems.

THERE'S more to instrumentation than instruments. Any control system, to do its job right, has to be designed for the methods, equipment, materials and of the process with which it works.

Here is where Honeywell Application Engineering steps in. First, a Honeywell engineering representative discusses process details with your engineers, production men and instrument technicians. Then he refers the problem to staff application engineers . . . each of whom is trained in the methods and control techniques for a specific industry.

These men work out details of what instrument to use for each measurement or control function . . . what type of primary element . . . what control system . . . what size and style of valve. Then they combine all these components into a complete system that is arranged for greatest production efficiency, convenience, and ease of service.

The new result to you is two-fold. First, this service saves you many valuable man-hours by supplementing the work of your own engineering staff. Second, you're assured of a control system that will give you the best in performance, not only of the Honeywell instruments, but also of the process which they serve.

Application engineering is one of the most important plus values you get from Honeywell instrumentation. Ask your local representative to discuss how it can go to work in your plant modernization or expansion . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, 4462 Wayne Avenue, Philadelphia 44, Pa.

MINNEAPOLIS
Honeywell
BROWN INSTRUMENTS
First in Controls

STANDARDS and SPECIALS by the Millions

THE FERRY CAP & SET SCREW CO.

2159 SCRANTON ROAD • • • CLEVELAND 13, OHIO

"SHINYHEADS"

America's Best Looking Cap Screw

Made of high carbon steel — AISI C-1038 — to standards for Full Finished hexagon head cap screws — bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 95,000-110,000 p.s.i. Carried in stock.

"HI-CARBS"

Heat Treated Black Satin Finish

Made of high carbon steel — AISI C-1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned; flat and chamfered. Tensile strength 130,000-160,000 p.s.i. Carried in stock.

"LO-CARBS"

Made of AISI C-1018 steel — bright finish. For use where heat treatment is not required and where ordinary hexagon heads are satisfactory. Hexagon heads die made to size — not machined. Points machine turned. Tensile strength 75,000-95,000 p.s.i. Carried in stock.

SET SCREWS

Square head and headless — cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.

FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

"SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered machined point. Nut end, oval point. Land between threads shiny, bright, mirror finish. Carried in stock.

ADJUSTING SCREWS

Valve tappet adjusting screws — Hexagon head style — to blue print specifications — hexagon head hard; polished if specified — threads soft to close tolerance — points machine turned; flat and chamfered.

CONNECTING ROD BOLTS

Made of alloy steel — heat treated — threads rolled or cut — finished to extremely close thread and body tolerances — body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.

SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.

FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert — steel covered. Finish: plain, zinc plated, cadmium plated. Size: 9/16", 3/4", 15/16" across the flats.

Tapped 1/4" to 3/4" inclusive. Cross section of Ferry patented acorn nut, showing how steel hexagon nut fits snugly into shell.

Pioneers and Recognized Specialists, Cold Upset Screw Products since 1907

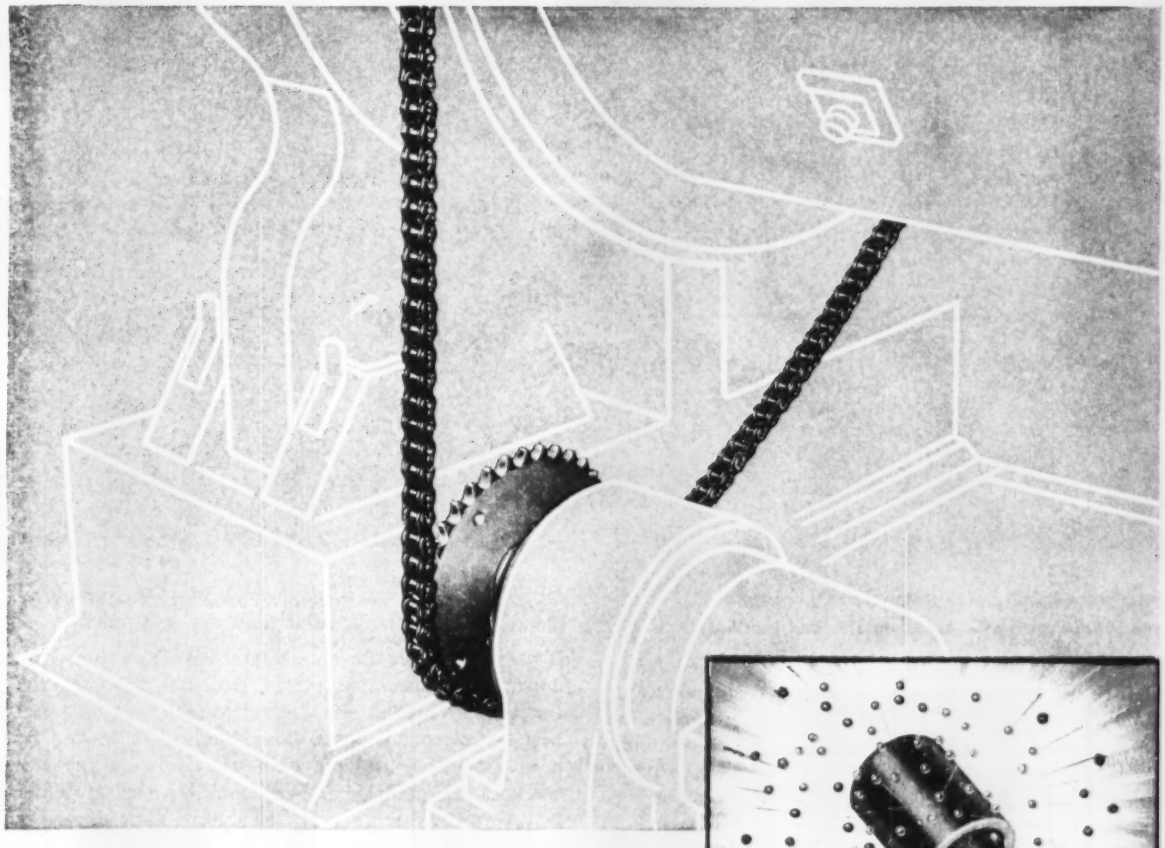
STANDARDS carried by LEADING DISTRIBUTORS

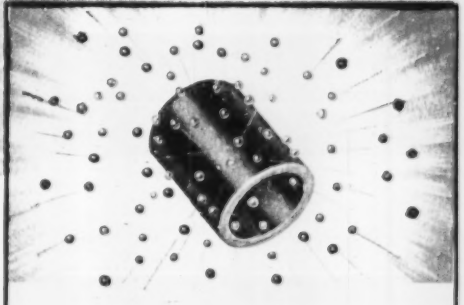
* SPECIALS furnished to BLUE PRINT SPECIFICATIONS

WRITE FOR INFORMATION

SEND FOR SAMPLES

There's EXTRA LIFE built into LINK-BELT roller chain





Look for the distinguishing darkened rollers. Thousands of tiny steel balls hammer the metal cold work each roller ... pay off in extra fatigue life ... added ability to withstand shock and impact of today's heavier loads.

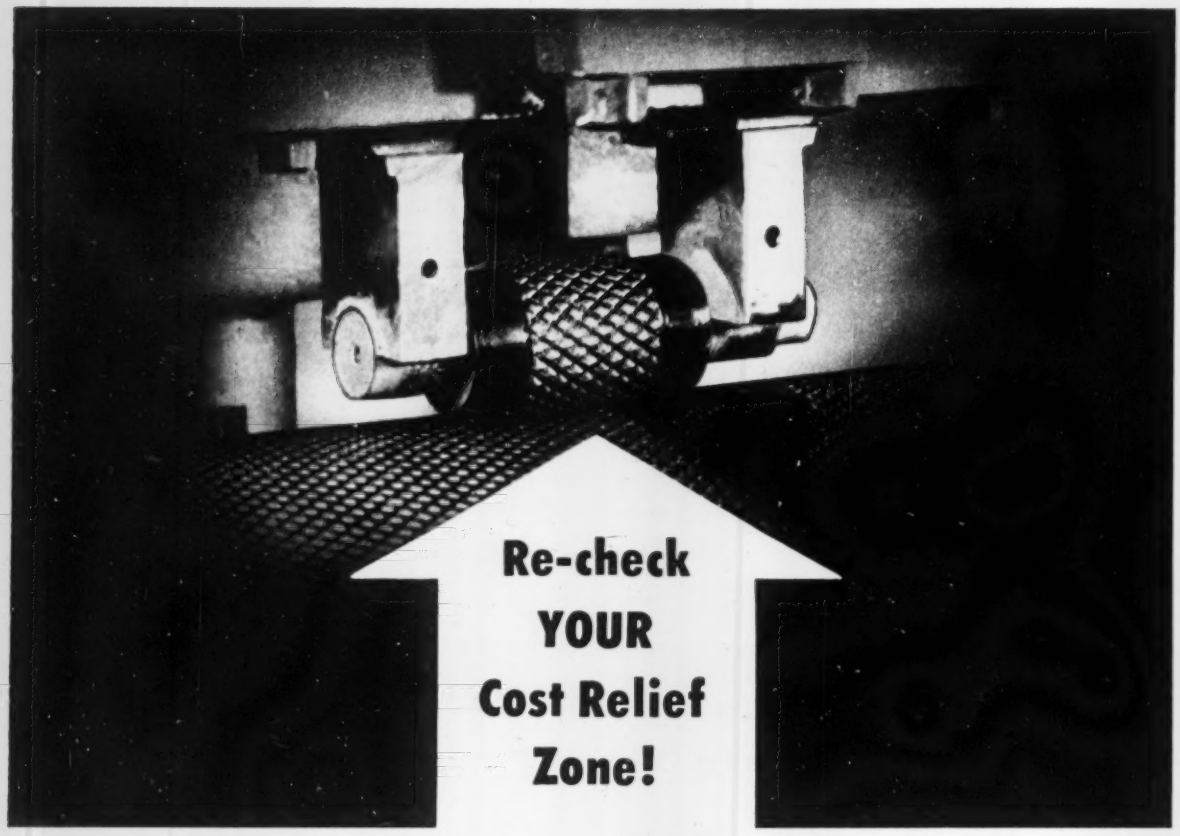
Shot-peened rollers are just one of many engineering extras you get from LINK-BELT

WHETHER it's for drive or conveyor service, every Link-Belt Roller Chain gives you a performance bonus. In addition to shot-peened rollers, lock-type bushings multiply capacity to withstand shock loading. And closer heat-treat control, rigid testing and thorough inspection pay off in greater uniformity . . . extra years of life. Link-Belt Precision Steel Roller Chain is built in single or multiple widths, 3/8" through 3" pitch. Double pitch 1" through 3". A call to your nearby Link-Belt office will bring you prompt, expert service. Send for Engineering Data Book No. 2157.

LINK-BELT

ROLLER CHAIN & SPROCKETS

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities



Re-check YOUR Cost Relief Zone!

Hundreds of Other Men Responsible for Tooling and Production Have Acted on This and Profited!

Here is a step you can take now to get relief from high production costs: *Re-check your tools and dies!* How much production time are you losing because of too frequent shutdown for die regrinding? How much *extra* money are you spending on costly die finishing, adjusting? Are your tools and dies breaking or wearing out too fast? A tool and die re-check will often give you the answers.

Take the job shown above. Knurling mills like this impress patterns on large .35% carbon steel rolls for embossing cloth and plastic. Some of the patterns are fragile and the sections as deep as 1/16" must not collapse. The mills must be hard enough to prevent upsetting, tough enough to prevent edges from breaking under pressures up to 5 tons. A re-check of the job showed that better performance could be expected if a more dependable die steel were used. Carpenter No. 11 Special (Water-Hard) met all of these requirements . . . and provided the necessary cost relief.

If you're looking for immediate ways to bring costs down to a respectable level, act on this now. Use the Carpenter Matched Set Method to select the one steel best suited to cut costs. This Method is backed by *dependable* tool and die steels that *stay* on the job. Then, for rush delivery, call your nearest Carpenter Mill-Branch Warehouse or Distributor. THE CARPENTER STEEL COMPANY, 139 W. BERN ST., READING, PA.

Are You Missing These Opportunities In *Your* Cost Relief Zone?

- Less die finishing and adjusting
- Greater output between grinds
- Fewer heat treating failures
- Less machine downtime

On Job After Job Carpenter Matched Tool and Die Steels Have Made Them Possible!

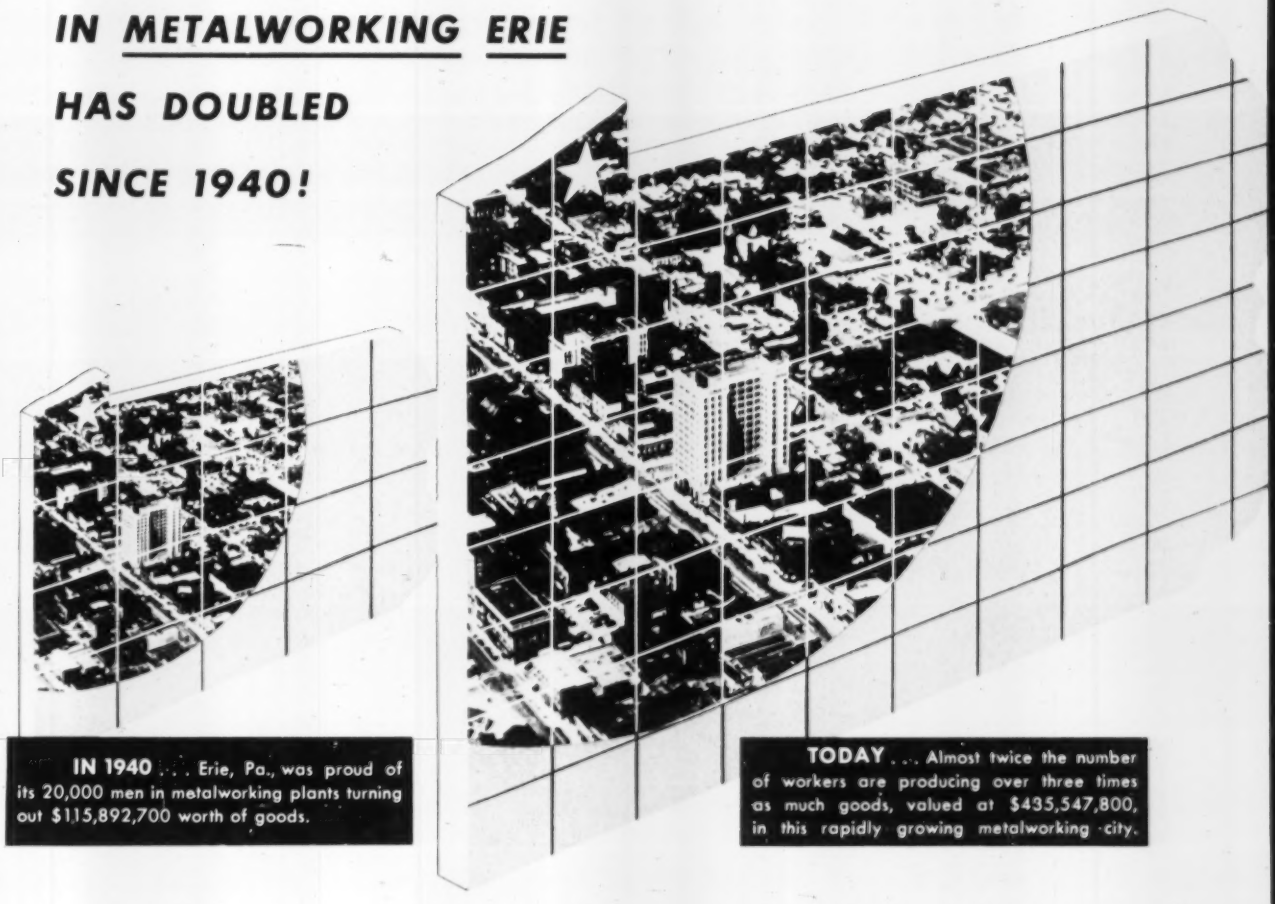
Carpenter

Matched Tool and Die Steels

Export Department: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Mill-Branch Warehouses and Distributors in Principal Cities Throughout the U. S. A. and Canada

LOOK HOW YOUR MARKET IN METALWORKING ERIE HAS DOUBLED SINCE 1940!



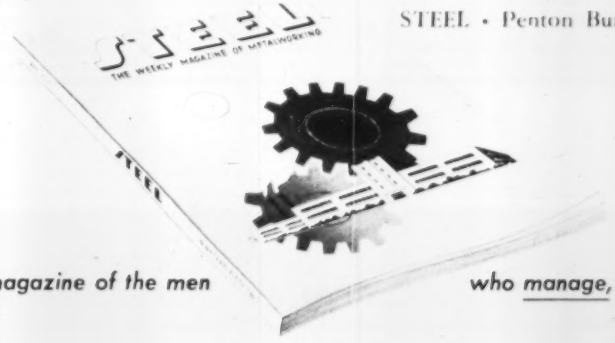
IN 1940 . . . Erie, Pa., was proud of its 20,000 men in metalworking plants turning out $115,892,700 worth of goods.

TODAY . . . Almost twice the number of workers are producing over three times as much goods, valued at $435,547,800, in this rapidly growing metalworking city.

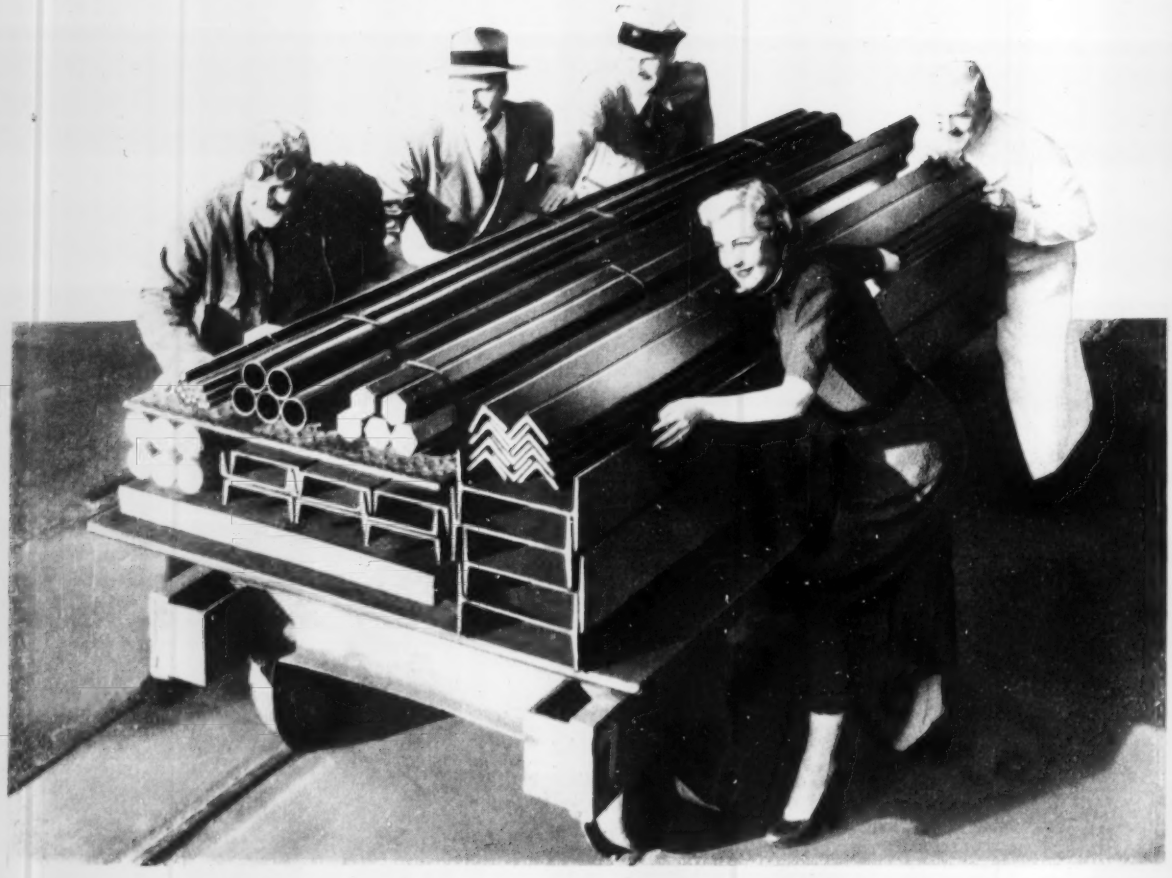
What are you doing to stake out your claim in fast-growing Metalworking America?

Pick practically *any* city in addition to Erie, and you'll find the same tremendous growth in your metalworking market. This twice-size growth in plants, workers and output has created a sales potential unequalled in the history of America. This is *your* market, but it isn't waiting for anybody. In its hustling urge to turn out "guns and butter" and grow even bigger, it is buying more goods than any other market in the world. The suppliers who aggressively stake out their claims in this market *now* . . . will have an "in" during the continued expansion ahead. STEEL can help you stake out your claim in Metalworking America faster and more efficiently. That's because STEEL already reaches more of the key men who run metalworking than any other industrial publication. And its continuing census of new plants under construction will *keep* it out front in the coverage you want. Ask the man from STEEL . . . he can prove it with facts and figures.

STEEL • Penton Building • Cleveland 13, Ohio



The magazine of the men who manage, operate and buy for the Metalworking industry



Steel-Service Team

In there - - Pushing

Now more than ever the help of an experienced steel-service organization is especially valuable. That's why it may well pay to get in touch with the nearest Ryerson office or plant.

Not that we can *always* furnish the steel you need—much as we would like to, and hard as we try. But, with controls relaxing a little and a few steel products coming into better supply, there are more opportunities for experience and ingenuity to take over. And experience, ingenuity—and the will to help are never in short supply at Ryerson.

Your nearby Ryerson plant is staffed with specialists on carbon, alloy and stainless steels who are always ready to work with you. Often they can suggest practical alternates when the steel you need is not available. And back of the Ryerson plant nearest you stand the resources of fourteen other Ryerson plants, making up the nation's largest steel-service organization. So when a kind or size is not on hand locally, we may be able to ship it from another plant.

With all Ryerson plants cooperating, and with Ryerson specialists helping to make the most of available steel, we are usually able to maintain service in spite of the current situation. So we suggest that you check with us regularly for all your steel requirements . . . There is nothing too difficult when it comes to working with a Ryerson customer.

Principal Products: Carbon, Alloy & Stainless Steels — Bars, Structurals, Plates, Sheets, Tubing, Machinery & Tools, Etc.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
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STEEL

The Metalworking Outlook

March 30, 1953

More Auto Price Cuts Likely

Chrysler Corp.'s move to lower prices an average of $100 on all Plymouth, Dodge, DeSoto and Chrysler cars is an action that will probably be followed—but not with such substantial cuts—by most other automakers. Tipoff that such is the case was the unusually heavy interest in cost-cutting shown at the Society of Automotive Engineers' production meeting in Cleveland last week. Chrysler Corp.'s sales had been fairly good, but not as terrific as hoped for with completely redesigned models.

Prices: Mostly Steady

Prices of other metalworking products will remain steady for the next few months, despite the end of price controls. True, scattered increases will occur, but not enough to snowball into anything like an avalanche. Tags on some farm equipment have already been marked up, and General Electric Co. will boost list prices of certain incandescent and other type lamps Apr. 1. Steel? No across-the-board boosts, but eventual increases on a few products.

Compromise on Standby Controls

Look for no serious Congressional opposition to legislative authority for a Defense Materials System to replace CMP July 1 (p. 49). The big debate will come on the issue of standby controls in case of all-out war. The administration doesn't want them. Many Democrats and influential private citizens, such as Bernard Baruch, do. The final law will be a compromise that probably will contain provision for a 90-day freeze on wages and prices in case of war.

Guaranteed Wage by 1954?

The big publicity given the United Auto Workers' convention resolution last week for the guaranteed annual wage obscures the fact that the real drive for it won't come until 1954 at the earliest and perhaps not until 1955. It can't come much earlier than that because the guaranteed annual wage plan involves a tie-in with state unemployment compensation, and Big Labor—mainly the UAW and the United Steelworkers who will co-operate in the drive—must start the time-consuming job of getting states to modify their laws.

Construction Prospects Rosy

A total construction volume of $44 billion is foreseen in 1953 by Association of General Contractors. It figures construction hit $42.3 billion last year. Despite the gain, watch for increased competition among contractors for your building business. Now that controls are off, more of the smaller contractors are becoming increasingly active in

Production Engineering News p. 81 The Market Outlook p. 145

bidding . . . Prefabricated housing will have importance in the total construction scene this year. Prefabricated Home Manufacturers' Institute says production in 1953 will exceed the 1952 record by 10 per cent.

Pay for Foremen

What are you paying foremen? National Foremen's Institute says that 38 per cent of them in manufacturing get $450-$500 a month; 14.3 per cent get $400-$450 a month; 10.1 per cent get $500-$525. A small number get more than $700 a month.

Ductile Iron Output To Double

Production of ductile iron will reach 200,000 tons in 1953, double the 1952 output, says Albert G. Zima of International Nickel Co. Inc. Production during 1949 was 3500 tons. Developed by International Nickel in that year, the process is now being used under license by 200 foundries, of which 100 are in the U.S.

C. F. & I. Buys Australian Iron

Colorado Fuel & Iron Corp.'s Claymont, Del., plant has purchased 60,000 tons of Australian basic pig iron at prices said to be fully competitive with the domestic market. The first 20,000 tons are scheduled for delivery within the next four to five months. C.F.&I. also considered getting its iron by rail across the country from its Pueblo, Colo., furnaces, but for the time being, at least, the import answer is more feasible.

Straws in the Wind

Thirty-five aluminum radiators for autos, deliberately placed where conditions are most severe, have been operating satisfactorily for more than a year . . . The first car is expected to roll off the assembly lines at Ford Motor Co. of Canada's new Oakville, Ont., plant by mid-May . . . Despite record corporate sales of about $500 billion in 1952 corporate profits dropped from $18 billion, the 1951 figure, to $17.1 billion for last year . . . Here's what income taxes do: Business borrowing rose by $279 million in the week ended Mar. 18, the largest increase since the week ended Sept. 17, 1952, also a period around quarterly tax paying time.

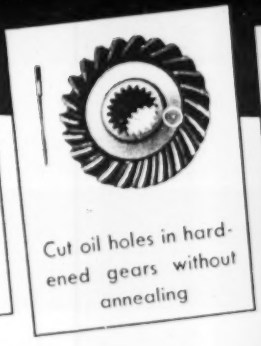
What Industry Is Doing

Businessmen plan to spend a record $27 billion in 1953 on new plant and equipment (p. 45) . . . Los Angeles stakes a claim as the metalworking capital of the West as it becomes the permanent home of the Western Metal Exposition & Congress (p. 46) . . . Stampers' business is running 20 per cent ahead of last year's, despite fewer war jobs (p. 47) . . . New materials and methods are developed to combat losses due to corrosion (p. 48) . . . The Defense Materials System takes shape (p. 49) . . . Iron ore carriers are ready for a record season if demand so requires (p. 50) . . . Needle bearings are growing rapidly in industrial usage (p. 52) . . . Businessmen must do their part in the business of government (pp. 53-60) . . . Suggestion plans are saving time, material and expense for the 6000 companies adopting the idea-producing systems (p. 61).

METAL DISINTEGRATION

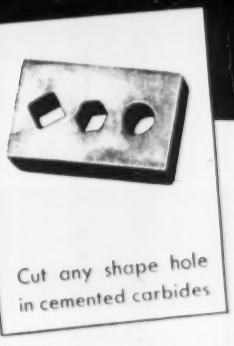
and what it can do for you . . .

Remove Broken Taps fast without distortion

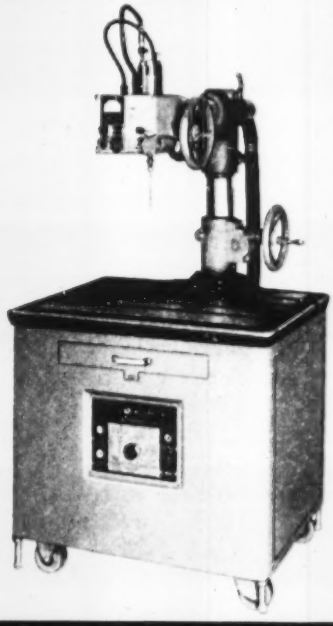


Cut oil holes in hardened gears without annealing

Cut dovetails in hardened dies



Cut any shape hole in cemented carbides



Literally hundreds of thousands of dollars are saved annually by corporations that are using Metalmasters in just tool and die repair alone.

There's a technical engineer in your area to give you an on-the-spot demonstration in your own plant at your convenience. (NOTE: It is not uncommon to pay for a Metalmaster with just one short demonstration thru savings on workpieces.)

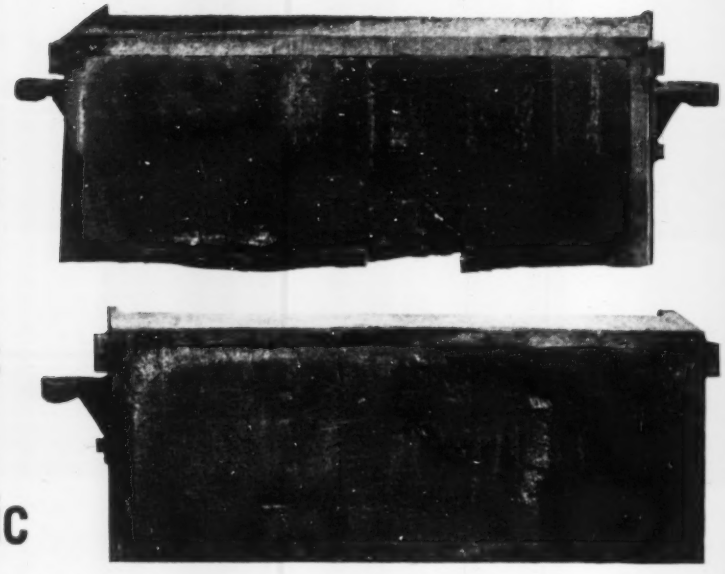
For information as to the Metalmasters' uses and benefits merely write today on your company letterhead to:

Metalmaster

DIVISION OF CLINTON MACHINE COMPANY

CLINTON, MICHIGAN

Ductile Iron Furnace Doors now used by General Electric



The Ductile Iron Door (lower photograph) is still good, as you can see, after three months of use on a steel forging furnace that operated with interior temperatures as high as 1950°F. After one week in same service, the gray cast iron door (upper photograph) is, obviously, ready for the junk heap.

Last 50 times longer...

At General Electric Company's River Works, West Lynn, Massachusetts, steel forging furnaces operate with interior temperatures as high as 1950° F.

Heretofore, gray cast iron door frames of these furnaces deteriorated from growth, warpage and scaling in about six days . . . and cost plenty in terms of down-time, replacement, and week-end overtime for repairs and maintenance.

Seeking a remedy, General Electric tried Ductile Iron door frames, cast by TAYLOR & FENN COMPANY, Windsor, Connecticut. And the result? Average life of these Ductile Iron doors is now estimated at about 300 days. Even though only seventeen furnaces reap this benefit, savings therefrom are estimated at $25,000 per year.

Ductile Iron provides oxidation and growth resistance to an extent heretofore unavailable in gray iron castings for furnaces, engines and other equipment subject to elevated temperatures.

High temperature applications of Ductile Iron castings include forging furnace door frames, sintering grate bars, pouring troughs, lifting plates for coil annealing machines, lifter bars in rolling mills, and scores of other parts subject to heat.

AVAILABILITY—Send us details of your prospective uses, so that we may suggest a source of supply from some 100 authorized foundries now producing Ductile Iron under patent licenses. Request a list of available publications on Ductile Iron . . . mail the coupon now.

INCO

The International Nickel Company, Inc.
Dept. 20, 67 Wall Street, New York 5, N. Y.

Please send me a list of publications on: DUCTILE IRON

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THE INTERNATIONAL NICKEL COMPANY, INC.

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Most Potent Force

It can be assumed that most students of industry-government relations will agree that the ideal situation would be one in which industrial executives and federal government officials have a sympathetic understanding of each other's problems, a respect for each other's motives and a real pride in each other's contributions to the national welfare.

In our really young and immature republic we have never approached within gunshot of this ideal. From the earliest pioneering days we have maintained a stubborn independence that more often than not has been manifested in a sort of "against the government" attitude. We proclaim our loyalty to flag and country but at the same time we insist upon our right to criticize the people we elect to run our government.

The cordiality of relations between industry and government depends more upon personalities and circumstances than upon political party affiliations. Industrialists who were in the dog house when Teddy Roosevelt was President got along all right with Woodrow Wilson's administration. Unfortunately, the non-partisan aspect of industry-government relations was badly distorted if not destroyed by the Franklin D. Roosevelt and Harry S. Truman regimes, when a host of pampered pets were given carte blanche to smear and discount industry at every opportunity.

Today the situation has changed. Industry is not in the dog house as far as the new administration is concerned, but it must be remembered that in the vast precincts of bureaucracy in Washington there remain thousands of persons who still think their primary mission in life is to damn industry.

Obviously, the response to this challenge is a straight forward exposition of the real economic, political and social contributions of American industry. Production provides the wherewithal for every reform, improvement, social security or other advantage for which "do gooders" take credit. When the relations between industrial leaders and government officials become sufficiently co-operative to establish this fact as a basic foundation for improving the welfare of the nation, we will begin to make real progress. Industry's job is to demonstrate that its competitive free enterprise system is the most potent force for social progress in the world today.

E. L. Shaner

EDITOR-IN-CHIEF

CAPITAL OUTLAYS RISE: Many persons have felt that expenditures for new plant and equipment in 1950, 1951 and 1952 were so heavy that a decline in 1953 was almost inevitable. Apparently they are wrong. The Department of Commerce and the Securities & Exchange Commission (p. 45) have conducted a survey which indicates that capital outlays this

year will total around $27 billion. This compares with $26.5 billion in 1952, $25.6 billion in 1951 and $20.6 billion in 1950.

However, the pattern of plant and equipment expenditures will differ sharply from that of recent years. The railroads and primary iron, steel and nonferrous producers will reduce their capital expenditures considerably. Public utilities and some machinery manufacturers will increase their investments substantially.

* * *

HAILS L. A. IN METALS: Ever since the middle of March, reports of salesmen covering metalworking plants in the East and Middle West have contained numerous notations such as this: "Unable to see Mr. Jones. He is enroute to California for the Metal Show." The extent of this heavy exodus was revealed last week when it was apparent that attendance at the Western Metal Exposition & Congress (p. 46, pp. 86-90) was approaching 30,000.

About 350 companies and their distributors set up 253 exhibits in Los Angeles' Pan-Pacific Auditorium and in tents which were hastily erected to accommodate the overflow. Seven national societies, participating in the Congress, provided an impressive array of technical papers, symposiums and panel discussions in the new L. A. Hotel Statler. It was significant and appropriate that some of the newer metals particularly titanium, zirconium and new nonferrous alloys vied with the old standard metals for the attention of metallurgists, designers and operating men. An unprecedented total of 21 papers were presented on zirconium alone.

Visitors were impressed with the rapidly growing stature of Southern California as a metalworking center. In fact, this growth is largely responsible for the decision by the sponsoring American Society for Metals that henceforth Los Angeles will be the permanent home of the western show and congress.

* * *

AMAZING CONSERVATION: Remember, shortly after the Japanese attacked at Pearl Harbor, the lengths to which industry and government went to conserve precious tin? How well that cooperative program worked is indicated by a statement made by officials of the American Can Co. According to them (p. 46), 46,900 tons of tin were required in the production of tin mill supplies for containers in 1941, while in 1952 only 27,772 tons of tin were required, even though 18 billion more cans were produced. It is estimated that about 257,000 tons of tin were saved in the production of cans since 1941 through tinplate conservation programs.

This is a wonderful achievement. It speaks volumes for what industry and government can do in time of emergency when aided by ingenuity, research and effective teamwork.

* * *

POINT OF LOWER YIELD: Reports from soft coal producing areas indicate that the contract signed last year by the United Mine Workers and the coal operators is not working as well as John L. Lewis anticipated. In fact, fears expressed by employers during negotiations are being realized. They argued that increasing the royalty for the welfare fund from 30 to 40 cents per ton would collide head-on with the law of diminishing return.

Exactly that is happening. Last year's contract gave added impetus to the market trend of recent years that of pricing coal out of its natural market. Today some good mines are working only three days a week. Lower production has caused the Lewis "welfare fund" to receive fewer dollars at 40 cents a ton than it netted when the "take" was only 30 cents a ton. Non-union operators, of which there are more than is generally realized, are in an advantageous position.

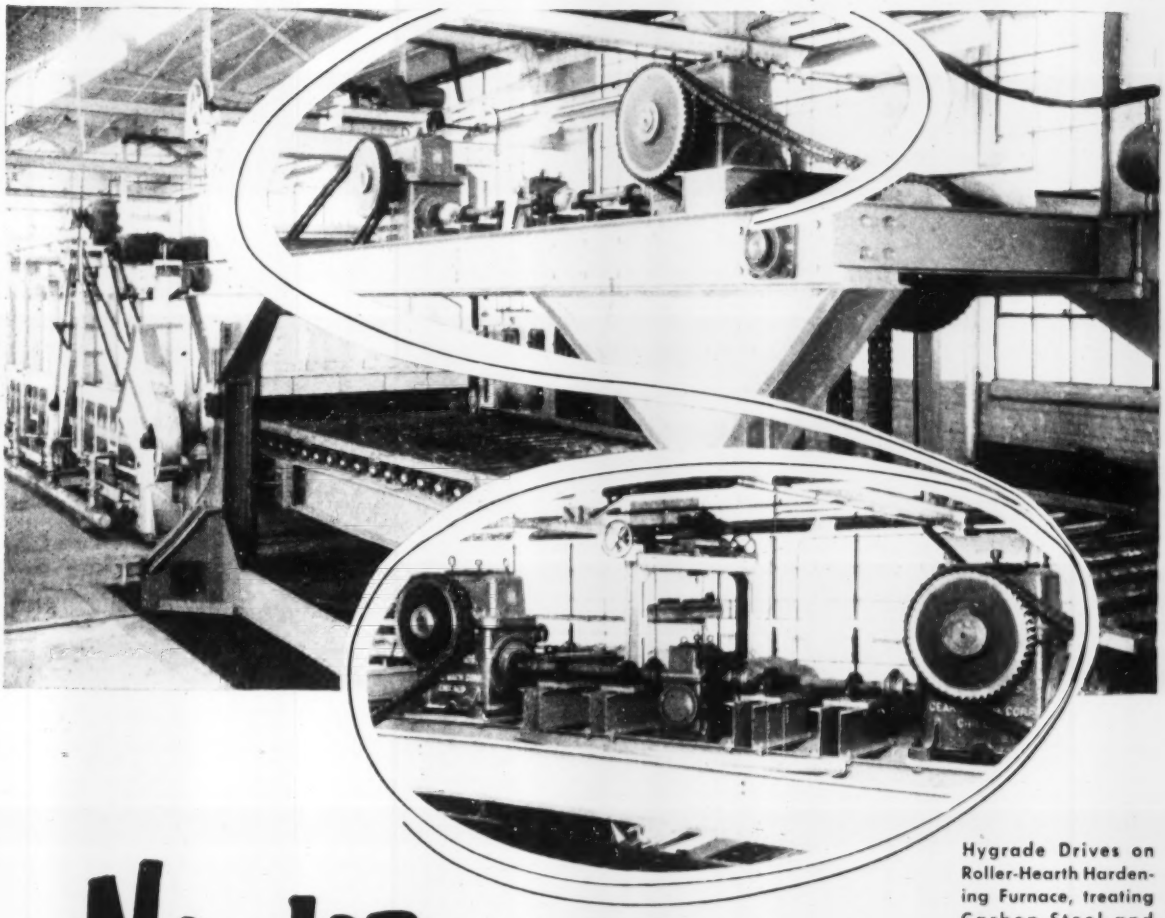
It is not wise to dismiss the old law of diminishing return with impunity.

* * *

ORE FLEET IS ON JOB: A sure sign of spring is the opening of navigation on the Great Lakes. This year the first ore carriers to go north for their cargoes were scheduled to leave lower lake ports last Friday. This is earlier than the average opening date.

Fortunately the 1953 ore fleet will be capable of meeting almost any conceivable demand that may be placed upon it. Its 292 vessels (p. 49) will have a trip capacity of 3,018,000 gross tons. Also, many of the newer carriers can make more trips per season.

Veteran lake shippers predict the fleet will bring down from 95 to 100 million gross tons in 1953. The record is 92 million tons in 1942. If hard pressed the fleet could carry 105 million tons or more.



Hygrade Drives on Roller-Hearth Hardening Furnace, treating Carbon Steel and Armor Plate, built by DREVER COMPANY, PHILADELPHIA.

No Job For A Weakling

Handling hot plate is no job for weaklings. This is why the Drever Company chose rugged, powerful Hygrade Drives on this Roller-Hearth Hardening Furnace. These sturdy units not only handle this tough job with ease, but with minimum maintenance.

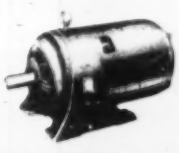
Wherever you have a speed reduction problem where low cost and rugged dependability are essential, the Hygrade Line of Enclosed Worm Gear Drives offers a solution. Available in a wide range of ratios and h.p. capacities in horizontal and vertical types. Vertical drives are also available with wider low speed bearing span to accommodate long, unsupported output shaft extensions.

FOOTE BROS.

Better Power Transmission Through Better Gears

Maxi-Power Drives

Line-O-Power Drives



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Foote Bros. Gear and Machine Corporation
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Please send a free copy of Bulletin HGB on Foote Bros. Hygrade Worm Gear Drives.

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✓ test

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✓ observe

✓ measure

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✓ analyze

✓ correlate

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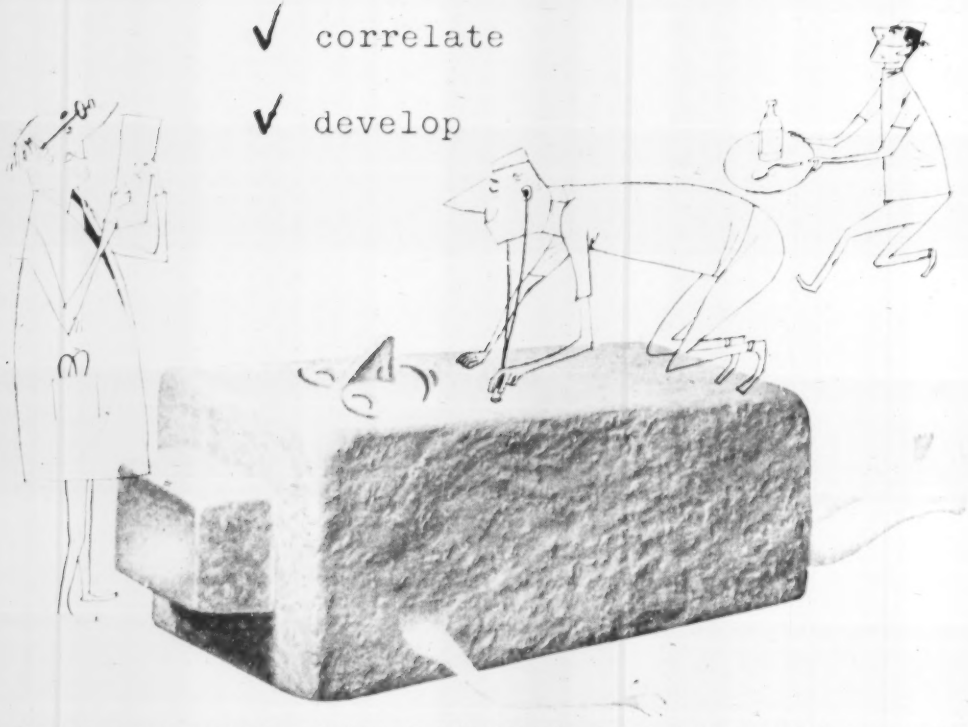

Probing into the structure of ingots is typical of the Inland research that pays off in improved steels for you, such as sheets of better drawing quality and fewer surface defects.

These hard-to-please research metallurgists have also come up with such Inland products as faster machining LEDLOY steels, one-coat TI-NAMEL enameling iron sheets, stronger bonding HI-BOND reinforcing bars and many others.

And, we're glad to report, they're still at it!

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U.S. Steel

NEW PLANT AND EQUIPMENT EXPENDITURES
(Millions of dollars)

	1952	1953	Percent Change
ALL INDUSTRIES	26,455	26,991	2
Manufacturing	11,994	12,039	0
Durable-goods industries	5,784	5,523	−5
Nondurable-goods industries	6,210	6,516	5
Mining	880	910	3
Railroads	1,391	1,294	−7
Transportation, other than rail	1,363	1,380	1
Public utilities	3,838	4,368	14
Commercial and other	6,989	7,000	0

Source: Securities and Exchange Commission and Department of Commerce

New Peak for Capital Outlays?

Business optimism continues high as industry predicts a record $27 billion expenditure in 1953 for new plant and equipment. Prospects for depreciation reform improve

AMERICAN businessmen plan to spend a record $27 billion in 1953 on new plant and equipment. They'll spend even more if the Republicans in the Treasury liberalize the depreciation rules.

The table above shows that expectations about capital outlays, as reported to the Commerce department and the Securities & Exchange Commission, are the most optimistic in the public utility field, the most pessimistic in the railroad and durable goods industries.

Where It Will Come—Most of the decline in durable goods spending will come in primary iron and steel, nonferrous metals and nonautomotive transportation equipment. Machinery firms plan substantial increases in investment, while most other major durable goods makers expect little change in outlays from 1952 rates.

Plant and equipment expenditures will be higher in the first half than in the second. Businessmen have scheduled outlays at seasonally adjusted annual rates of $27.5 billion in the first quarter and $28.1 billion in the second quarter of 1953. Even with a drop in the second half, 1953 will comfortably surpass the $26.5 billion expended in 1952, the $25.6 billion in 1951 and the $20.6 billion in 1950.

Time for Action — This year's heavy capital spending will be still higher, most observers believe, if the Treasury department moves quickly to change the antiquated rules on depreciation for tax purposes. In 1934 the government put out a seemingly innocuous Bulletin F, a schedule of useful lives for a vast list of physical assets. The bulletin was changed a little in 1942. That edition, modified occasionally in the past decade, has become the depreciation bible for industry. It sets up the average useful life for physical assets at 20.74 years.

From 1934 on, Treasury's Bureau of Internal Revenue required industry to follow Bulletin F schedules unless it could prove that historically it has followed its own. BIR originally thought most of industry would have the factual data to prove its figures. Few companies did. The result: Bulletin F is the near-universal gospel, and on the average, the depreciation tax credit on your physical assets can amount to only 5 per cent annually for 20 years of original value.

In Agreement—Specialists on the subject, even some in government, now agree that federal depreciation policies have meant: Inadequate account is taken of inflation; industry is forced to use antiquated equipment; and BIR is as much as five years behind in its tax audits, partly because of all the red tape involved in depreciation rules.

Five-year amortization has helped the situation somewhat, but only temporarily. The peak in defense expansion is past, and authorizations for the fast tax writeoff have been dropping steadily since mid-1952. So the clamor for permanent reform is growing louder. And the Republicans are listening.

Knotty Problem—The real question now is how to relieve the situation, not to convince Treasury officials that reform is needed. Here are some of the major remedies that Treasury men are studying: Allow the taxpayer to adopt any schedule of useful life that he pleases; permit a big first-year allowance of 20 or 25 per cent of original value; make five-year amortization a permanent policy

Radio-Active Tracers for Pneumatic Tubes

Sixty cents worth of radio-active cobalt is currently keeping the 8000 feet of pneumatic tubing in Carborundum Co.'s internal communication system open for business. Absorbent paper discs, 1 inch in diameter, are placed in a solution of soluble cobalt and water and hermetically sealed between two pieces of plastic in the mailing carriers. One man, armed with a Geiger counter, can then quickly locate any stoppage in the tubes. The amount of cobalt used makes the mail carriers no more dangerous than the average luminous wristwatch dial

for all industry; allow a complete writeoff in two-thirds the estimated useful life of industrial plant and equipment.

The last suggestion, championed by Machinery & Allied Products Institute, probably has the best chance of acceptance. In the long run, the scheme would mean no loss in tax revenues to the government, perhaps even gains, but it would mean a drop in tax income in early years of the changeover a decrease of maybe $1 billion the first year.

Even at that, the loss would be still greater if any of the other ideas were implemented. The decline in taxes in the early years that would unavoidably result from any changeover is awkward at a time when the Eisenhower administration is trying to make good on its campaign pledge to balance the budget.

So, depreciation reform will take political courage. But many tax experts say it will have beneficial results politically, too. It will help assure prosperity and votes by stimulating businessmen to continue to spend heavily for new plant and equipment.

New Goal for Blast Furnaces

An additional 2 million net tons of annual capacity have been added to the original expansion goal of 85 million net tons for blast furnace capacity to assure sufficient pig iron for production of steel ingots to meet mobilization needs. The completion date has been moved from Jan. 1, 1954, to Jan. 1, 1955, to allow for the additional tonnage.

The new goal of 87 million tons will be about 16.7 million net tons annual capacity over that in existence on Jan. 1, 1950. Capacity figures include facilities to produce pig iron for steel ingots and castings but do not include ferroalloy capacity.

Tin Savings Mount

Industry-government coordination in research has saved about 257,000 tons of tin since 1941 through tinplate conservation programs in production of cans. In making this statement, officials of American Can Co., New York, reported that 46,900 tons of tin were used in production of tin mill supplies for containers in 1941, while by 1952 that figure had dropped to 27,772 tons, although 18 billion more cans were produced by the entire industry.

L. A. Attracts Industry

Western metal show makes Los Angeles its permanent home as the city makes big gains

LOS ANGELES is staking a claim as metalworking capital of the West. Henceforth that city will be the permanent home of the Western Metal Exposition & Congress, previously shared with San Francisco and Oakland, Calif.

At last week's exposition, 253 exhibits of some 350 companies and their distributors bulged out the walls of Los Angeles' Pan-Pacific Auditorium. Metal Show Manager W. H. Eisenman rented one circus-size tent, then another, to house the show largest of eight held on the West Coast since 1929. (See page 86 for further news about the exposition.)

Crowds Pour in—Before the week was out, registered attendance was expected to reach 30,000. The San Francisco-Oakland section had 166 exhibits; attendance was 10,079.

More than ever before, the show reflected growing importance of western markets. Exhibits of eastern manufacturers in earlier shows were often left for their western distributors to plan. This year more eastern companies sent their best men to study Los Angeles' industrial achievements.

Heavy Industry—Interested observers discovered: California ranks sixth in metalworking plants employing over 20, of which two-thirds are in the southern half of the state. Some 300 eastern companies operate plants in Los Angeles. Of these firms, 71 located there in the last three years, not including the Hevi-Duty Electric Co., Milwaukee, and Lindberg Engineering Co., Chicago, announced at the exposition. More aircraft workers were employed in southern California than in the entire U. S. in World War II.

The congress was a success, also. Seven national societies held week-long discussions on technical problems at Los Angeles' Hotel Statler.

Stampers: Pressing for Production

Their business is running 20 per cent ahead of last year's, although defense jobs slip. Automotive, appliance and electronics orders account for much of the gain

A BELLWETHER industry, stamping, is ringing to the tune of good

business at least 20 per cent better than last year's.

That's fine news not only for stampers but for industry generally, too. Stampings are used in such a wide variety of metalworking's products that good business among pressed metal shops means good business among most of metalworking which is ordering stampings. That optimism dominated the corridor talk at the Fourth Spring Technical meeting of Pressed Metal Institute in Cleveland last week.

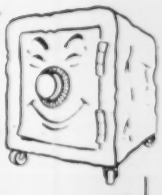
Backlogs—Job stamping shops now have about 15 weeks' backlog of automotive orders, 29 weeks' work for the military and 17 weeks' backlog for all other customers. Backlogs for automotive and military buyers are holding steady but new orders for miscellaneous purposes are climbing mainly from appliance and electronics manufacturers.

Job stampers are now doing about 28 per cent of their business for automotive customers, 15 per cent for the military and 57 per cent for other manufacturers. In all of 1952, the automakers got 27 per cent of the jobbing shops' production, the military accounted for 21 per cent and all others took 52 per cent. Nobody knows exactly what total business volume the jobbing industry is doing because of the difference in definition of what a stamping plant is and because many of the small plants don't report their sales. A government study of job stampers other than automotive puts the 1951 volume at $496 million. In 1952 that category's activities brought in only $451 million, but this year business is virtually certain to exceed $500 million.

Troubles — The industry could do even better if it had all the steel it could use. Wallace F. Ardussi, president of Variety Machine & Stamping Co., Cleveland, and of PMI, reflects the opinion of many executives when he says, "Steel availability is one of our worst headaches." Sheet and strip of virtually all gages are causing problems.

The purchase of tooling is no problem. Jobbers turn out about half of their needs themselves.

Safe Fights: Thief Writes



MOSLER SAFE Co., New York, has won an unsolicited testimonial from a frustrated burglar.

"I know when I'm licked," wrote the unhappy safecracker, after failing to open a Mosler-manufactured safe in a San Bernardino, Calif., department store. "I can truthfully state that this is the most difficult job I have ever attempted, and the manufacturer of this fine safe is to be congratulated."

Mosler may have contributed indirectly to a reduction in the San Bernardino crime rate. In his letter the burglar promised not to return to safe-cracking.

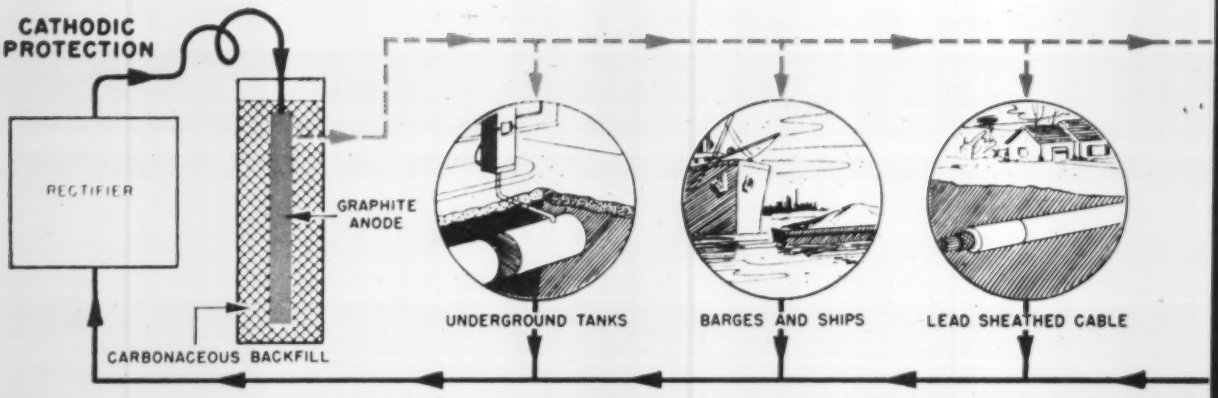
Post-Korea Union Contract Trends Surveyed

THE DRIFT toward the union shop continues; the checkoff is assuming many different forms; and almost one out of two union contracts provide for an assured flow of money into union coffers through the double-barrelled use of maintenance of membership and checkoff clauses.

Those conditions were pointed up by a National Industrial Conference Board survey of 602 post-Korea union contracts, consisting of 277 AFL, 219 CIO and 106 independent union agreements and covering 3 million workers.

Box score on the results of the survey reads as follows:

Provision	Occurrence
Contracts providing for the union shop	34%
Modified union shop	11
Maintenance of membership clause in union shop contracts	20
Open-shop contracts	33
Contracts providing for the checkoff	72
Union shop contracts calling for the checkoff	60
Open-shop contracts calling for the checkoff	81
Dues to be checked off in the 435 contracts calling for the checkoff	100
Initiation fees to be checked off	48
Assessments to be checked off	20
Fines to be checked off	2
Reinstatement fees to be checked off	2
Assurance of union funds through both union security clause and checkoff	46
Assurance of union funds through union security clause only	21
Assurance of union funds through checkoff only	26
No union security clause or checkoff clause	6



New Materials and Methods Emphasize that . . .

CORROSION CONTROL Grows in

CORROSION PREVENTION is big business. Each year $1 billion is lost by destruction of buried and submerged metal structures most of which can be prevented by the application of cathodic protection. Each year some $2 billion is spent for painting just to protect metal structures and equipment against corrosion.

New Approach—Most company managements have become aware that the tax levied by corrosion can be reduced effectively by application of science and technology. A new attitude prevails: It's more sensible to prevent corrosion than to repair the damage.

This has lent impetus to the development of new products and processes to help industry cope with its corrosion problems. Some 85 companies showed what they had to offer in the fight against corrosion in exhibits at the National Association of Corrosion Engineers' conference in Chicago, March 16-20.

Reverse the Process—Buried pipe and other metal structures can be protected indefinitely by use of cathodic protection. Corrosion of metal in contact with soils or water results from the creation of anodic and cathodic areas by reason of differences in soil or water composition and other causes.

In the anodic areas, current leaves the surface of the structure and enters the soil or water, causing pitting action. In the cathodic areas current flows from the soil or water into the surfaces of the structure and no corrosion occurs. The principle of cathodic protection is based on forcing direct current to flow from the soil or water into all surfaces of the structure, so that the entire structure is cathodic and in a non-corrosive state.

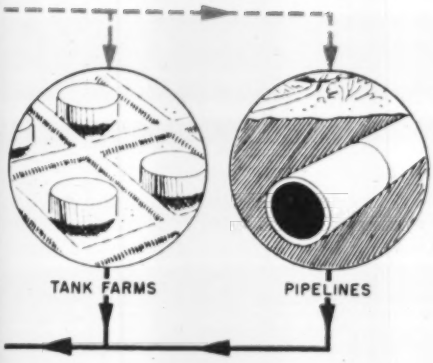
Two Methods—One widely used method of cathodic protection is through the combination of a rectifier or other source of d-c current and a graphite ground anode. Cathodic protection without use of external electric current employs sacrificial anodes of magnesium or zinc. Anodes of these metals set up a galvanic cell with the steel structure giving electric current that protects steel from corrosion. Savings of corrosion costs, with rapid economic pay off, are obtained with the application of cathodic protection to gas and water distribution systems, elevated water tanks, water treating tanks and equipment, well casings, heat exchangers, transmission tower fittings. Over a dozen companies are in the business. They have engineers experienced in this specialized field who stand ready to help industry make proper and efficient application of this method of corrosion prevention.

Save the Surface—Modern protective coatings engineered for the tough jobs fill a big gap in industry's arsenal of weapons for corrosion fighting. Tar base coatings have proved to be a real workhorse, providing maximum protection and low cost.

DeVilbiss

As new synthetic resins and solvents have been developed in recent years, new and increasingly efficient protective coatings have been produced to combat almost every form of corrosion in industry. A number of protective coatings producers showed off their wares at the NACE exhibition.

Low Alloy Steel Better — One highlight of the technical conference was a report by F. L. LaQue, International Nickel Co., and J. A. Boylan, Parker Rust-Proof Co., which gave an answer to the



Importance

question as to whether the improved atmospheric corrosion resistance of alloy steels is of any advantage when they are painted. The steels studied represented 20-1 difference in atmospheric corrosion between an exceptionally low copper content ingot iron and a typical low alloy high strength steel.

The low alloy steel performed best, the copper steel next and the low content open hearth iron was worst whether painted or bare. The best performance was that of a low alloy high strength steel with a zinc phosphate treatment. The paint system used was a common automobile finish.

Taking office as president of NACE on March 20 was Walter F. Rogers, Gulf Oil Corp., Houston, moving up from vice president.

The new vice president is Aaron J. Wachter, Shell Development Co., Emeryville, Calif. R. A. Brannon, Humble Pipe Line Co., Houston, begins his third year as treasurer.

Next Week in STEEL

The April 6 issue of STEEL will feature a special technical report on how to fight corrosion in your plant and on your products.

DMS Shapes Up

New terms, new wrinkles appear in the Defense Materials System

THE DEFENSE MATERIALS system Regulation 1 has been unofficially thrown into the Washington-alphabet soup by H. B. McCoy, acting National Production Authority administrator. It contains some new terms you'll want to become familiar with.

As yet, DMS Reg. 1 is unofficial because Congress hasn't extended the life of Title 1 of the Defense Production Act which will be the basis for DMS as it is now for CMP. But Arthur Flemming, acting defense mobilizer, explained the need for Title-1 and DMS to the Senate Banking & Currency committee and passage seems assured.

Divided by Five—DMS Reg. 1 shapes up much as it was predicted in STEEL, Mar. 16, p. 67. Defense programs identified by symbols A,B,C,D and E will be carried out under DMS Reg. 1 (production) and Reg. 2 (construction). Tonnage set-asides of steel, copper and aluminum will be made for these defense needs. Latest estimates of defense takes for third quarter, 1953, are 30 per cent of aluminum production, 22 to 25 per cent of the copper, and 15 per cent of the steel; remainders of each metal are free for all other demands. Five new "allotting agencies" have authority to allot materials not only for direct defense and Atomic Energy Commission requirements but also for "military preference" requirements.

"Allotting agencies" are the Department of Defense, Atomic Energy Commission, National Production Authority, Defense Electric Power Administration and the Civil Aeronautics Administration. The term "military preference" covers indirect defense needs vital to the military and AEC programs. While not fully interpreted, this feature makes it possible for an allotting agency to provide a priority to equip a new plant, for example, where it could be proved the completion and operation of the plant is vital to defense.

Case of Preference — ODM and NPA officials say that military preference will be permitted only when defense needs demand it. The Air Force heavy press program is cited as being in the category of military requirements which will receive priority.

While still without official scaffolding, DMS amendments and interpretations are to be issued as soon as they are formulated to smooth out the transition from full materials control to a partial control system. Among exceptions to partial controls are six alloying elements, including nickel, to be kept under full allocation. Some provision is expected which will enable civilian industry to get its share of scarce machine tools, too. Where the old CMP allowed 30 to 40 per cent of output of machine tools to be shipped against unrated orders, the DMS regulation, as it now stands, would allow rated orders to take the full output of machine tools.

Same Old Effect—Another feature of the Defense Materials System which differentiates it from CMP is the omission of inventory control. A provision making it illegal to buy more priority material than needed for the use against which a rating has been issued has the virtual effect of such control, though.

In line with DMS, all civilian and defense supporting controlled materials tickets for the third quarter were cancelled last week in Direction 21 to CMP Reg. 1 and Direction 11 to CMP Reg. 6. NPA ruled, however, that second-quarter holdovers will receive preference over new unrated orders for third quarter delivery.

Canada Lifts Import-Export Ban

Canada lifted all export and import controls on shipments to and from the U. S. of all nonferrous metals, except nickel and nickel-bearing materials, in the form of ores, concentrates, scrap, fabricated forms and ingots.

Exporters and importers no longer need government approval on shipments across the U. S.-Canadian border of aluminum, copper, tin, tungsten, zinc, antimony, bismuth, brass, bronze, cadmium, cobalt, lead and molybdenum.

Ackerman

Ore stocks are comfortably high as spring finds . . .

Iron Ore Carriers Ready for Record Season

All-rail shipments helped keep iron ore stocks at lower lake ports in good shape. A record 100-million-ton carrying season is possible if demand remains high

THE 1953 ore carrying season may well be a record-breaking one. But, like most seasons, it's iffy.

An enlarged Great Lakes carrying fleet could bring down from upper lake ports some 100 to 105 million gross tons of iron ore. And they will, if the demands of the steel industry are sustained throughout the year. Such ifs as the weather and ice will also affect the total tonnage hauled, of course, as they do each season.

Opening Day—Pittsburgh Steamship Division, U. S. Steel Corp., hopes to inaugurate the '53 shipping before Apr. 1 as nine ships of the Pittsburgh fleet were scheduled to leave their lay-up berths on lower lake ports for the head of the lakes on Mar. 27. Most shippers will follow suit during the first week in April. That's a little-earlier-than-average opening.

When six new vessels join the ore carrying fleet sometime during the 1953 season, the total lake fleet will number 292 vessels, compared to 289 ships at the end of the 1945 season, the previous peak. Big difference in the comparison comes not in total number of vessels, but in trip capacity of the two fleets 3,018,00 gross tons in 1953, 2,787,000 gross tons in 1945 and in increased speed of the modern vessels which enable them to make more trips per season. Thirty-one vessels have been retired from lake service since 1945 and have been replaced by these newer, faster ships.

Welcome Harbinger—Opening of the shipping season this year is looked forward to, but not as desperately as was predicted last fall. With stocks at lower lake ports and furnaces totaling 29,948,749 gross tons on Mar. 1, 1953, compared with 29,207,005 gross tons a year earlier, the outlook is good. Even if the season does not open until mid-April stocks will be above the 20-million-ton mark. Shortages are local affairs in certain grades of ore.

Partial answer to comfortable iron ore stockpiles was the 8-week steel strike last year, which conserved ore already down the lakes. All-rail shipments were an important factor, too. Rail shipments amounted to 5,524,688 gross tons in 1952, down from the 7,918,798-gross ton peak in 1951, but well above the normal of 1948-1950 of 2 to 2.5 million gross tons. Rail shipments were about 300,000 tons in February, 1953, and will dip when the lake traffic opens. They probably will be at '52 levels over the year, however, and will therefore remain a significant factor in ore haulage.

Still a Record—More conservative members of the lake shippers are predicting a 95 to 100 million gross ton season in 1953. At that, it will be a record-breaker; previous best year was 1942 when 92 million tons were brought down.

Quebec OK's Ungava Bay Plan

Cyrus S. Eaton, who heads the Steep Rock iron ore development in Canada, received permission from the Quebec government to proceed with developing vast iron ore deposits near Ungava bay in the far northern region of the province.

Atlantic Iron Ore Ltd., which Mr. Eaton organized, will conduct the operation. Canadian government geologists will help make studies of the area. A major problem to be solved is the fact that Ungava bay, the most economical outlet for the ores, is ice-locked about nine months each year. The deposits are so far north that the nearest and most logical markets will be in Europe rather than America.

Schiess Forms U. S. Affiliate

Schiess A. G., one of Europe's largest builders of heavy machine tools, is investing $250,000 to form an American affiliate, American Schiess Corp. The Dusseldorf, Germany, manufacturer will send engineers and mechanics to provide technical assistance for automotive, aircraft, shipbuilding and other plants using Schiess equipment in the U. S. and Canada.

General offices will be located in New York, while the company plans to establish engineering headquarters and servicing facilities in Pittsburgh.

Robert C. Zeile was appointed manager of the Pittsburgh office. Formerly he was Pennsylvania district manager of Kurt Orban Co. Inc., New York.

NTDMA Announces New Survey

National Tool & Die Manufacturers Association will conduct a survey of the contract tool and die in-

dustry to determine what is being done in apprentice training. The association hopes the survey will stimulate interest in expanding such programs which must develop the highly skilled craftsmen needed for the industry.

NTDMA also is preparing a 20-minute color motion picture called *Tool and Die Making—Keystone of Mass Production*, to be released later this year. It will be used in a program to encourage young men with the proper mechanical abilities to become tool and diemakers.

Missile Output Launched

Manufacturers looking for government prime or subcontracts might well look into the opportunities offered by the guided missile program.

Several thousand manufacturers are already engaged in guided missile production either as primes or subs, says Brig. Gen. Thomas K. Vincent, director of the Army's research program on guided missiles and rockets. He spoke before the American Society of Tool Engineers at their Detroit meeting. Between 25 and 30 major companies may hold large prime contracts when the program reaches its peak, he indicates, and for each of these firms up to 1000 subcontractors may be needed.

The U. S. at present has two guided missiles in production the "Nike" and another, still unnamed. Based on knowledge and knowhow gained from the German V-2 Rockets, the new missiles are greatly improved over their World War II ancestor. Both guided missile types are large enough to carry a variety of warheads, probably including the atomic head.

No Stretch-Out Seen

Few manufacturers will be affected by expected cuts in the Defense department's budget

PROPOSED CUTS in military expenditures probably won't cause a general stretch-out of defense production. Only manufacturers whose defense items are outpacing the rearmament program will find their delivery dates moved ahead, say Defense department officials.

The monthly rate of military expenditures, which rose steadily in the final months of the Truman administration, has been stopped in its tracks at the $3.6 billion level of January. Defense spending in the coming months is expected to remain at this level or taper off somewhat. The department's obligational authority for fiscal 1954 may be lowered as much as $5 billion under the $41.5-billion ceiling requested by President Truman.

Output Synchronized—Few manufacturers will be affected much by the economy program, however. Most of the saving will come from reduction of manpower in the armed forces and government agencies. Nevertheless, some readjustment will occur in military output as the government attempts to synchronize the various factors in the defense economy.

Defense Secretary Wilson says that the previous administration over-shot its mark in its preparations for an all-out war economy. Too many stand-by plants were erected and tooled up, he indicates. Easy-to-get equipment, he said, was bought and paid for before it could be matched with long-production items needed to make finished equipment.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $100,000

PRODUCT	CONTRACTOR
Tractors, Warehouse	Northwestern Motor Co., Eau Claire, Wis.
Motor Vehicle Parts	Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Parts for Diesel Engines	General Motors Corp., Detroit
Shells, 90 mm	Standard Steel Spring Co., Coraopolis, Pa.
Shells, 81 mm	Nesco Inc., Milwaukee
Mines	Tacoma Metals Products Co., Tacoma, Wash.
Primers, Percussion	Harper Wyman Co., Chicago
Guns, 90 mm	General Motors Corp., Detroit
Revolvers	Colt's Mfg. Co., Hartford, Conn.
Small Arms Parts	Saginaw Products Corp., Saginaw, Mich.
Aircraft Pressure Gages	U. S. Gage Div. of American Machinery & Metals Inc., Sellersville, Pa.
Intervalometers	Abrams Instrument Corp., Lansing, Mich.
Generators	Jack & Heintz Inc., Cleveland
Camera Kits	Douglas Aircraft Co. Inc., Santa Monica, Calif.
Telephone Switchboards	Automatic Electric Corp., Chicago
Space Heaters, Oil Fired	Viking Mfg. Co., Cleveland
Jacks, Hydraulic	Weaver Mfg. Co., Springfield, Ill.
Searchlights	Strong Electric Corp., Toledo, O.
Electron Tubes	Litton Industries Inc., San Carlos, Calif.
Concrete Mixers	J. D. Adams Mfg. Co., Indianapolis

CHECKLIST ON CONTROLS

Materials Orders

COPPER — Amendment of Mar. 20, 1953, of NPA Order M-16 and revocation of Direction 1 to M-16 remove allocation control over copper scrap and copper-base alloy scrap, copper-base alloy ingot, blister copper, copper and copper-base alloy shot and waffle and copper precipitates, effective Mar. 20.

MANGANESE—Amendment 1 of NPA Order M-80, issued and effective Mar. 20, 1953, redefines ferromanganese in the order to include standard manganese having a content of 74 to 76 per cent managanese as well as the grade previously known as standard manganese with 78 to 82 per cent manganese content.

Defense Materials System

STEEL, COPPER, ALUMINUM—Defense Materials System Regulation 1, covering production, and Defense Materials System Regulation 2, covering construction, both issued and effective Mar. 23, 1953, set up a new materials control system limited to assuring deliveries of enough steel, copper and aluminum for the Department of Defense and the Atomic Energy Commission.

Controlled Materials Plan

CIVILIAN DECONTROL — Direction 21 to CMP Regulation 1 and Direction 11 to CMP Regulation 6, both issued and effective Mar. 23, 1953, remove both controls and program assistance from civilian production and construction requiring controlled materials beginning with third-quarter requirements.

NPA Regulations

DO RATINGS—Direction 6 to NPA Regulation 2, issued and effective Mar. 23, 1953, makes five changes in DO ratings to achieve conformance with the basic changes created by Defense Materials System Regulations 1 and 2.

BASIC RULES—Amendments of Mar. 23, 1953, of NPA Regulations 2 and 3 bring the operation of the priorities system in this country and between Canada and the United States into conformity with the new Defense Materials System. Both amendments were effective Mar. 23.

Mineral Order

HOARDING—Mineral Order 1, which prohibited hoarding of various strategic materials, was revoked effective Mar. 19, 1953.

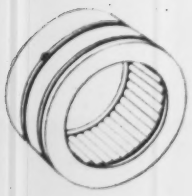
Appointments in Washington

Kenneth W. Gemmill, member of the law firm of Barnes, Dechert,. Price, Myers & Rhoads, Philadelphia, was appointed assistant to the secretary of the treasury.

Phillip Young was appointed chairman of the Civil Service Commission.

Louis S. Rothschild, Kansas City, Mo., was appointed chairman of the Advisory Board of the Inland Waterways Corp., Commerce department.

Brig. Gen. Walter K. Wilson Jr. was designated by the Army Engineer Corps as Mediterranean division engineer with headquarters at Casablanca, French Morocco.



Industry Gets the Needle

In their proper places, needle bearings have been of great value in cutting down space requirements and carrying heavy radial loads

NEEDLE BEARINGS, in a period of development in this country covering only about 20 years, have come a long way, and they still have a long life ahead of them. They have advanced from relatively few uses until now you find them in applications ranging from giant aircraft to wooden artificial legs.

The needle bearing generally refers to a unit of a number of individual needles or small diameter rollers each six to ten times longer than its diameter encased in a race to direct their action. Unlike the conventional roller bearing, there is no cage or separator retaining the rollers. However, the needles can be used individually where the parts in which they are installed form their own race, as in automatic transmissions and universal joints. Two big advantages of such bearings are they take less space and have a maximum radial load-carrying capacity.

Bonanza — Automatic transmissions have proved to be a real boost to those manufacturers who emphasize production of loose rollers or needles. G. M.'s Hydra-Matic transmission has from 170 to 190 needles compared with 50 or 60 in the older manual transmission. And last year 2.1 million new cars were equipped with no-shift mechanisms. Another heavy user of rollers is the power steering unit, where space is at a premium. In all, the new car can have as many as 400-500 needles, and auto production may hit a new high this year. So could needle bearing production.

The aircraft industry also has been one of the heaviest users of needle bearings. Some makers think that it was this industry that proved the value of needle bearings. They were used in some World War II planes, and since then have been used wherever they have been found applicable. The giant B-29 uses something like 3000 units in its construction.

Heavy Users — Other heavy users include farm machinery, machine tools, textile machinery, gear pumps, power shovels, oil well equipment, road machinery, universal joints, appliances, portable power tools and material handling equipment.

There are various types of needle bearings to fit the wide variety of jobs mentioned above. Where light load and smoothness of operation are the prime characteristics, the shell-type bearing is best. This type, made by Torrington Co., Torrington, Conn., has a surface-hardened thin-drawn shell as the outer race. If ability to withstand heavy duty and shock is required, a heavier, precision-machined housing is used.

No Difficulty—The bearings are made mostly of 52100 steel alloy, which has not been difficult to obtain. In fact, the industry has had little, if any, production problems in recent years.

The main difficulty has been to see that they are not applied to jobs where they are not suitable or recommended. Like all anti-friction bearings, they have their proper uses and do not fit every job.

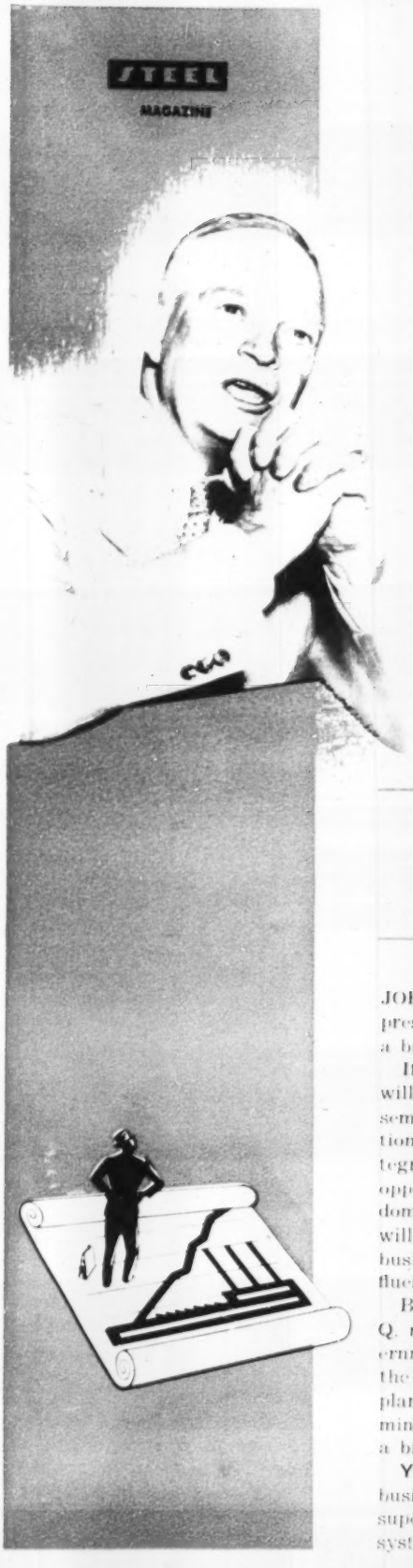
Sustaining—However, new uses are being found constantly enough to keep the eight companies making needle bearings working at a fast pace. The eight are: Torrington; Orange Roller Bearing Co. Inc., Orange, N. J.; Roller Bearing Co. of America, Trenton, N. J.; McGill Mfg. Co., Valparaiso, Ind.; Kaydon Engineering Co., Muskegon, Mich.; American Roller Bearing Co., Pittsburgh; Bremen Bearings Inc., Bremen, Ind.; and Smith Bearing Co., Trerton, N. J.

Last year, according to one manufacturer, the industry sold about 87 million worth of the bearings, or about 2 per cent of the entire antifriction bearing output. That was lower than 1951 production because of the steel strike. This year looks to be better than that, with new uses coming in and auto production going up.

No. 2 STEEL's Management Series . . .

The editors of STEEL herewith present the second in a series of ten articles in its Program for Management. The complete list:

1. Public and Community Relations (Feb. 23, page 51)
2. Industry-Government Relations
3. Research, Basic and Product
4. Purchasing
5. Forecasting Business Trends
6. Distribution — Post-Emergency Challenge
7. Labor and Industry Relations
8. New Materials
9. Depreciation and Re-Equipment
10. Market Research



Let's Do Our Part In This Business Of Government

". . . in this spirit let us together turn to the great tasks before us."

DWIGHT D. EISENHOWER, *State of the Union Message*

JOHN Q. PUBLIC identifies the present national administration as a businessman's administration.

If it is a good administration, he will like it. If it restores some semblance of soundness to our national economy, re-establishes integrity in government, offers the opportunity for prosperity, freedom and peace, then businessmen will rise in his estimation. The business community will gain in influence.

But if it fails in these aims, John Q. may turn back to the big government boys. He will harken to the demagogues and the socialistic planners. Then the present administration may be no more than a brief pause in a New Deal tide.

You're In — For twenty years businessmen have talked of the superiority of the free enterprise system. We have boasted of our ability, if given a chance, to make available the benefits of a free, competitive economy to all.

Now is the chance.

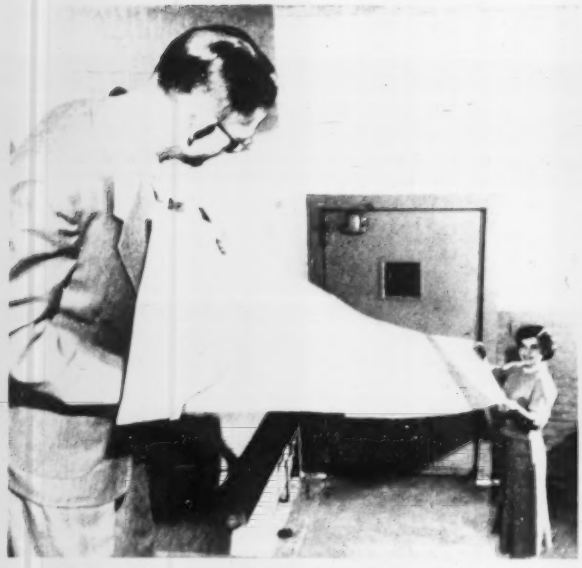
The challenge is not easy.

The Problem

After ten weeks in office, the Eisenhower administration's domestic policy is evolving slowly and undramatically. It is in marked contrast to the "first hundred days" of President Roosevelt's first term in 1933.

The administration moved rapidly to remove controls from wages, prices and materials. But aside from the return to free markets there is as yet little action in translating campaign promises into accomplished fact.

Clean-Up Job — The reason, of course, is that after twenty years



TAX PROBLEM—High on the list of what business wants is reform in the national tax structure and a reasonable limitation of the government's take. Many a management man dreams of the day when net income again can be greater than the tax take. Photo shows 12-foot stretch of tax returns and schedules required of Republic Aviation. The check for taxes was also hefty—$19 million

GOOD-BY TO THIS—Remember when troops carried Sewell Avery, Montgomery Ward chairman, from his office in 1944 after President Roosevelt ordered his plant seized because the company wouldn't accede to union demands? The issue of plant seizure to enforce union demands again arose in 1952 when President Truman seized the steel industry. The Supreme Court ruled his act improper

of waste, extravagance and duplication, the greatest job confronting the new administration is that of clearing away the debris.

"The size and complexity of our government staggers the imagination," says Sinclair Weeks, secretary of commerce. "We shall clean up the mess. But the mess is worse than the public thought. The new administration has the backbone for the job. But we do not have enough new brooms."

Like an Iceberg—Another member of the administration likens the situation to an iceberg. "You can see maybe one-ninth of it. What you can't see is the eight-ninths that is under water."

President Eisenhower in his State of the Union message warned: "It is important that all of us understand that this administration does not and cannot begin its task with a clean slate. Much already has been written on the record, beyond our power quickly to erase or to amend. This record includes our inherited burden of indebtedness and obligations and deficits."

Obstacles—Businessmen find it hard to comprehend the difficulties that are confronting the new administration. Take the matter of personnel alone. Most of the hundreds of thousands of government employees are under Civil Service regulations. It is virtually impossible to take them off the government pay roll.

While the majority of such employees are reasonably intelligent, industrious and efficient, they are not much help in clearing away the debris of an overly complex governmental structure. Naturally, they wish to protect their jobs. And most of them like the idea of big government. They have grown up in a big government atmosphere during the past twenty years. They in effect constitute a mass of inertia to the new administration.

Needed: New Brooms — On the other side, consider the problem of recruiting able businessmen to help clean up the mess. True, President Eisenhower has recruited a top team of exceedingly able men. All answered the call to the government at tremendous personal sacrifice. But there aren't enough men available at the second level of authority. Most any businessman who has served in Washington can tell you why.

The president of a Philadelphia metalworking company tells this story. When the new administration team was being recruited he was approached by a cabinet member and persuaded to accept a job in the new administration. He was reluctant to do so. As president of his company he was paid $40,000 a year. In addition he was building up a pension reserve, owned stock in the company. His family was happily situated in Philadelphia. His children were in school.

But he recognized the need for doing a job in Washington and accepted. His motives were wholly patriotic.

When he arrived in Washington, he learned that the salary for the

government job was in the $8000 bracket. But he couldn't just start on the job he had been begged to take. Once in Washington, he was asked to fill out a long and complicated application for the job. He was compelled to reveal in detail personal and financial history. Then he had to wait around Washington for weeks until he was cleared for the job.

What Business Can Do

The transition from private industry to governmental jobs is not easy. But the fact remains that the most important step in improving business-government relations is for industry to detach more of its top men for nonpolitical government jobs.

Industry "can protect the interests of both itself and the public by lending its personnel," advise Robert Heller and F. L. Elmendorf of Robert Heller & Associates, Cleveland. These men are in a unique position to judge industry-government relationships because they work in both fields. As management consultants they list among their clients many of the blue chip companies of industry. They assisted the government in the unification of the armed services, worked for the Hoover Commission on the reorganization of the executive branch, wrote the first practical plan for the reorganization of Congress, and currently are working on reorganization of the Post Office and other government functions.

The benefits of lend-leasing business personnel to government work two ways. It not only results in a better understanding of business problems by government but it also results in a better understanding of the problems of government by businessmen.

Lend-Lease—Inland Steel President Clarence B. Randall advocates lend-lease of business talent to government.

"We need a new tradition of public service, a new habit of mind by which businessmen actively seek participation in public affairs. . . . Every business institution that believes in the preservation of free enterprise should make this possible, and encourage us to do so.

"We will be better men when we

By SINCLAIR WEEKS
Secretary of Commerce

Sunnier Business Climate in Washington . . .

Were the Weather Bureau of the Commerce department operating an economic observation balloon, it would report today that the Washington climate for business is much warmer than in years.

In the Eisenhower administration business is not looked upon as the prey of a Robin Hood government that hampers its scope with unnecessary controls and excessive taxes, or makes it the victim of punitive malice.

The new administration intends to apply business principles of thrift, efficiency and real public service to all phases of government.

The Department of Commerce, the traditional collector and publisher of significant statistics, intends to give industry the most accurate and complete facts available within our means on which business can base wise judgment and sound action. In our various operational agencies, like Maritime Administration, Civil Aeronautics, Patent Office, Public Roads and others, the same spirit of service is uppermost.

We plan more use of advisory groups from different fields of private industry in determining department policies.

Commerce is the voice of business in government. It is bringing to the attention of others in public office the problems and opinions of the business community. The administration thus has the business point of view before it as national policies and actions are formulated and carried out.

We in Commerce want business to realize that this is our role and to utilize it to fullest advantage by continually presenting its ideas to us for further action.

How to Talk with Washington

CHAMBER OF COMMERCE OF THE UNITED STATES
NATIONAL ASSOCIATION OF MANUFACTURERS

On broad national issues, the National Chamber and NAM serve to determine the views of business, set up a common program of business thought and action, and bring this program to the attention of the public, the Congress and the executive branches of government. Both maintain strong Washington offices, manned by men skilled in their jobs. Both issue publications to keep members informed of pending legislative and executive actions.

TRADE ASSOCIATIONS

On specific industry problems, your best voice may be your trade association. Most trade association executives spend a substantial portion of their time in Washington, know whom to see about what.

INDUSTRY ADVISORY GROUPS

One of the most direct channels of communication between business and government is industry advisory groups. The Bureau of Census was the first to set up such committees in 1902, now has close to 100. National Production Authority has more than 500, which will be continued after NPA is cut back at midyear. Benefits often are contingent on attitudes of representatives.

WASHINGTON OFFICE

If your company is big, you may maintain a Washington office. If you are that big, you should already know the answers.

WASHINGTON REPRESENTATIVES

Thousands of representatives are available in Washington to handle every conceivable type of contact or problem for a fee. Some are reliable and effective. Others are phony influence peddlers. Problem is selection.

INDIVIDUAL EXECUTIVE CONTACT—In Washington

If your problem is concerned with policy or program, it may well pay to go to Washington to talk to a responsible government officer. Set up your appointments in advance and be sure they are with men high enough to talk policy or program. Waste no time with the Indians.

INDIVIDUAL CONTACT—At Local Level

If your problem is one of information or service, you may get complete satisfaction from the local or area office with expenditure of less time and expense. Field offices of the Department of Commerce alone are processing 160,000 inquiries a month. During the war, field office inquiries reached a peak of 350,000 a month.

CONGRESSMEN

Don't forget your representatives and senators and don't let them forget you. Congressmen depend on the thinking of their constituents more than you may believe. They are anxious to hear what you think and your beliefs may often influence how they vote and what they say on the floors of Congress. Shun the inspired, pressure-type of telegram and letter; give them your honest thinking.

return, and the business will have a stronger team in that substitutes will be trained and tested in our absence.

"Nor am I concerned at what this will cost in money, since the unbelievable cost of letting others do these jobs for us already has been fully demonstrated."

Need Financial Support — Mr. Randall suggests that our laws be changed to permit business to fully reimburse the added expense of living away from home for those who are willing to make the personal sacrifice required.

"I have never personally known or seen documented a case where a businessman has used such a position to help unfairly either himself or his company. It is the maddest sort of folly to deny good citizens, both corporate and individual, this avenue for serving their country by not letting their companies hold their incomes level."

Lend Ideas — Businessmen who do not go to Washington can be a great help by giving government officials the benefit of their honest thinking on national problems. The new administration gives every indication it will receive such ideas sympathetically.

During the wartime emergencies, many industrialists came into close contact with the government by serving on industry advisory committees. These served as a means of placing industry's thinking on specific problems before the appropriate government officials and also acquainted businessmen with many of the perplexing problems faced by the government agencies.

The more than 500 industry advisory committees established under the National Production Authority will be continued after NPA itself is pared down at midyear. They will continue to offer a channel of direct communication between business groups and the Department of Commerce. Other government divisions likewise have industry advisory committees. The Census Bureau organized its first in 1902 and boasts more than fifty years of co-operative interchange of ideas with businessmen.

Talk With Government — Better industry-government relationships depend on better mutual understanding. Such understanding can

DIRECT COMMUNICATIONS—Industry advisory committees established under the National Production Authority bring industry and government representatives together face to face to discuss specific problems. Result often is better mutual understanding of business by the government representatives and a better understanding of government problems by the businessmen

result from better communication between businessmen and government people in policy-making jobs.

This is the consensus of industrial executives and top government people interviewed by the editors of this magazine.

Sometimes the beliefs of the business community best can be presented to the government through the various associations organized by business. These groups are acquainted with all the correct channels of communication, generally are sensitive to the feeling of the business community, and are skilled in placing the facts before the proper government people.

At other times, personal presentation by the business executive is more effective. Both business and government men agree it may be dangerous to let business associations or your lawyer do much of your talking or thinking for you.

What Business Wants

Several score metalworking executives were asked by the editors what they want from the government.

Their replies covered much common ground. Without exception, they asked for nothing in the way of special privilege or treatment. They push no special projects.

What they want is a government that would make available to all Americans the benefits of our vast productive machine on a fair and ever-increasing basis.

Integrity—Most frequently mentioned aim was for integrity in government. They believe that a government that lacks moral soundness cannot provide for the welfare of the people nor execute properly the true functions of government.

Economy — Waste and extravagance in government expenditures and the duplication of effort among the many divisions of government are topics on which any businessman will become articulate.

There is almost unanimous belief that the national government during the past twenty years has assumed functions that are unnecessary and improper. There is a hope that many of these functions, if they are necessary at all, can be returned to the states or local subdivisions. The belief is general that one of freedom's greatest threats is too much government too far away from home.

Businessmen recognize that world conditions have made necessary a large part of government spending for defense. This they do not begrudge, provided that steps are taken to make each dollar buy a dollar's worth of materiel. Inefficiency and waste in the procurement of military supplies may offer the greatest opportunities for economies.

The task of reducing expenditures cannot be accomplished by the administration and the Congress alone. Much of the pressure for government spending comes from people pushing pet projects.

Taxes—Rigorous economy is recognized as the key to tax reduction. But businessmen realize that the huge national debt and the obligations already incurred plus the necessity for continuing high defense expenditures limit the possibilities of debt reduction.

They believe that the present tax system is penalizing incentives to work and to produce and that such incentive-killing provisions should undergo close scrutiny and reform.

Generally they favor a constitutional amendment to limit the taxing power of Congress.

Less Intervention—The abolition of controls by the new administration generally is approved by business. The business community believes controls at best should be only a temporary expedient during periods of actual emergency.

They believe that a free economy will regulate wages, prices and the flow of materials better under any but actual emergency conditions far better than the best planned controls.

Government Services Available

COMMERCE DEPARTMENT:

Office of Business Economics publishes *Survey of Current Business* reporting gross national product, business population data, inventories, business trends, other economic information.

Division of Commercial Standards Develops industry standards upon industry initiative.

Office of Technical Services Publishes declassified government technical information. Sponsors National Inventors Council to encourage inventive contributions to defense.

Trade Association Division Publishes list of trade association and calendar of their meetings.

Census Bureau Makes special marketing analyses studies on a fee basis; carries on regular census statistical work.

Civil Aeronautics Administration Responsible for air safety.

Weather Bureau Provides special weather forecasts to industry.

Maritime Administration Administers shipping and shipbuilding subsidies. Leases ships. Places shipbuilding contracts.

Patent Office Publishes *Register of Patents Available for Licensing or Sale*. Carries on regular patent work.

Inland Waterways Corp. Operates the Federal Barge Line as a common carrier. (This property is being offered for sale to private industry.)

Office of Distribution Will make distribution studies for business and industry. Is not yet off the ground.

Office of International Trade Fosters and promotes foreign commerce. Controls exports. Has charge of that portion of the Technical Co-operation Administration Point Four program which aims at industrializing backward countries to make them better customers for United States equipment and industrial materials. Publishes *Foreign Commerce Weekly*.

National Production Authority Certifies the need for expansion programs and projects. Encourages research and development work to produce more critical materials. Stimulates expansion for production of military end items. Continues materials control authority. Limited after June 30 to providing priority for military and defense-support needs.

Bureau of Standards Responsible for accuracy of all measuring instruments, gage blocks and other devices, for tests under the federal specifications. Conducts research in many materials. Conducts a Research Associates Plan whereby industry, by individual companies or groups, absorbs part of the cost of research and development work.

Office of Small Business Publishes daily the *Consolidated Synopsis of Proposed Procurements and Contracts Awarded*, which will cost $7.00 a year on subscription basis starting Apr. 1.

DEPARTMENT OF DEFENSE:

Now metalworking's biggest customer. Provides financial assistance to companies prosecuting research development work having potential defense values. Conducts Procurement Information Office which answers questions about defense procurement. Maintains Defense Supply Management Agency which develops military specifications and, in conference with industry representatives, conducts standardization work to increase interchangeability of parts of vehicles, internal combustion engines, refrigerating equipment, air conditioning equipment.

INTERIOR DEPARTMENT:

Bureau of Mines Conducts co-operative research programs with industry often contributing (as American Iron & Steel Institute contributions to maintenance of the bureau's manganese-from-slag program). Tests mining supplies and equipment on a fee basis. Conducts economic studies in co-operation with industry. Maintains a co-operative motion picture program with industry paying the expenses, the bureau distributing the films. Conducts wide range of studies in liaison with private industry as development of titanium processes, development of synthetic liquid motor fuel from the mineral to the final end product.

They believe that the less unnecessary intervention by government in business the better.

Profit—The lack of understanding of the true role of profit in our economy amazes and frustrates most businessmen. To them it is basic in our system. It is why this country with less than 6 per cent of the world's land area and 7 per cent of the world's population is able to boast 70 per cent of the world's automobiles, 60 per cent of its telephones, half of its radios, half of its steel production and 40 per cent of the total manufacturing output.

To this end, many business enterprises or groups of business enterprises are supporting courses in basic economics and other programs to further better public understanding of the profit-and-loss system.

Full Output—The output made possible by the American system is shared by all the people in this country. The automobiles, telephones, radios, television sets and other conveniences are found in all the homes of America.

Business wants recognition of this fact in government.

Welfare — Progressive social legislation and welfare plans that will protect the aged, disabled and the destitute have wide support by business. However necessary and desirable social security is, busi-

to Industry

Geological Survey. Conducts water and mineral surveys for industry.

Defense Agencies whose status after June 30 remains to be fixed by Congress:

Defense Minerals Exploration Administration. Provides financial assistance for exploration of 34 critical minerals.

Defense Electric Power Administration. Responsible for electric power expansion program, also for maintaining supply of power to all defense establishments.

Defense Solid Fuels Administration. Responsible for necessary expansion in capacity to produce solid fuels, including authority to recommend defense expansion loans.

Petroleum Administration for Defense. Responsible for maintenance of petroleum products production.

MUTUAL SECURITY ORGANIZATION:

Responsible for all mutual security and Point Four technical and economic assistance. Publishes information about foreign trade opportunities. Guarantees exporters against expropriation and inconvertibility of foreign funds. Sends industrialists abroad to help mutual security and Point Four programs. When assistance is principally Point Four rather than military, work is carried on through State department's Technical Cooperation Administration.

RECONSTRUCTION FINANCE CORPORATION:

Makes direct government loans. Helps prospective borrowers to get bank loans and frequently participates in such bank loans.

FEDERAL TRADE COMMISSION:

Maintains Trade Practices Division to assist industries in formulation of approved trade practice codes.

DEFENSE TRANSPORT ADMINISTRATION:

Responsible for maintenance and necessary expansion in various fields of transportation.

ATOMIC ENERGY COMMISSION:

Places extensive research, development, and operating contracts. Authorizes contractors to sell isotopes to make radiographs, and for use in industrial processes, noncontact thickness gages, and the development of new and improved industrial processes.

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS:

Performs basic research work in aeronautics. Places research contracts with institutions not only to amplify its own efforts but to train new research workers in this field.

NATIONAL SCIENCE FOUNDATION:

Finances basic research in all fields of industry, and fosters and encourages scientific research generally.

GENERAL SERVICES ADMINISTRATION:

Responsible for development of all federal (not including military) specifications. Responsible for nonmilitary government procurement, and also stockpile procurement.

Defense Materials Procurement Administration. Authorizes grants, guaranteed market contracts, and other financial and technical assistance to encourage production of critical minerals and metals in which the United States is deficient. Financing activities may cover all steps from the ore to the finished metal product. (Powers after June 30 still to be determined by Congress.)

OFFICE OF DEFENSE MOBILIZATION:

Top coordinator of all defense production needs. (Powers after June 30 still to be determined.)

DEPARTMENT OF AGRICULTURE:

Farm Machinery Division. Works cooperatively with manufacturers on development of apparatus for farms. Has worked recently, for example, on corrosion of sugar beet harvesting, fertilizer placement and pest control machinery, also metallurgy of plow steel. Performs extensive testing work.

SMALL DEFENSE PLANTS ADMINISTRATION:

Assists small business (a term defined as companies employing no more than 500 workers, or companies not the leaders in their industries, and hence applying to nearly all business) in obtaining government loans, needed materials, and defense and other government contracts, and in undertaking expansion programs. Provides technical and managerial assistance. Makes special surveys when necessary. Acts as the sponsor and friend of small business having dealings with other government departments and agencies on tax, renegotiation, labor and other matters. (Continuance of SDPA beyond June 30 remains to be effected by Congress.)

nessmen believe it is no substitute for productive employment and thrift. They believe it should be limited to providing a minimum layer of basic protection, leaving ample room for individual thrift and voluntary group effort.

Members of the Chamber of Commerce of the United States, representing a cross section of all kinds and sizes of business, voted overwhelmingly for a sweeping expansion of the social security program to cover all working and all retired persons. The plan would extend social security benefits to some five million aged persons who do not qualify under the present program.

Labor Relations—Business believes better labor relations would result from a minimum of government intervention. It believes government should lay down the ground rules for collective bargaining and establish equality for employers and unions.

The partisanship of recent national administrations in favor of the big labor bosses is bitterly resented.

Seizure of plants to enforce labor demands is regarded as a wanton infringement of freedom.

Stability—Last of all, business would like to see the re-establishment of stability in governmental policy and in the dollar.

Stability of policy would permit long-range planning to build the

facilities to provide new jobs. Business regards the expansion of job opportunities as one of its responsibilities. Every year about two million people enter the labor market and about 1.3 million die or retire. Thus is created a need for about 700,000 new jobs annually.

Businessmen estimate that each job requires about $11,000 in tools. If business and the country are to prosper, the jobs must be made available. Given reasonable stability, business believes it will provide them.

We Believe . . .

BUSINESS STATISTICS

that regular census statistics and statistics of major public interest are legitimate government activity. Many statistical services now performed by the government can be rendered more effectively and appropriately by private agencies and should be eliminated as a government activity. Importance of statistics should be weighed against the reporting burden placed on respondents.

CENTRALIZATION

that the trend toward ever larger federal government should be reversed. Service responsibilities should be performed by the smallest units competent to handle them adequately and economically. The federal government should withdraw to those areas of national interest and concern which require a national administration. To enable the states and local government to operate effectively, certain taxing powers should be reserved for the subdivisions.

CONTROLS

that wage and price controls should be imposed only as a temporary expedient during an actual emergency. At all other times government wage and price fixing is unnecessary.

DEPRECIATION

that methods of depreciation accounting should be changed to encourage constant replacement of equipment and facilities to keep the industrial machine as efficient as possible. Such reforms should reflect the changes in the purchasing power of the dollar.

GOVERNMENT COMPETITION

that the primary function of government should be political, not economic. Government should not participate in production and distribution activities which can be conducted more effectively by private enterprise. Subsidies, freedom from taxation and improper allocation of costs may give an apparent advantage to government but the taxpayer pays in the end. In large development projects, such as atomic energy, the government is the logical operator.

ECONOMY IN GOVERNMENT

that resolute insistence upon economy is a must. It is essential to lower taxes, reduction of debt and a stable economic system. Waste, which characterizes many government operations, including the military, must be fought at every turn. Reorganization based on Hoover Commission recommendations should be encouraged. Spending programs which are not strictly essential are luxuries and should be treated as such. Business must recognize that much of the pressure for spending comes from outside government and should be discouraged at the source.

LABOR RELATIONS

that legislation and its administration should provide equality for unions and employers. A minimum of controls should be exercised by government, and voluntary rather than government imposed solutions to disputes encouraged. Primary function of the government is the protection of the public.

PATENTS

that an extensive program of research and development is necessary to keep the nation strong and prosperous. To this end the patent system should be maintained, including freedom of patentees to grant licenses restricted as to use.

SEIZURE OF INDUSTRY

that seizure of property by the executive branch, as in President Truman's seizure of the steel industry, violates a fundamental constitutional guarantee.

SMALL BUSINESS

that new and small enterprises will make enduring progress only if a favorable economic climate is provided. Encouraging of risk capital, fair enforcement of laws against monopoly and restraint of trade, and a tax structure that will permit growth are more important than preferential treatment.

SOCIAL SECURITY

that a sound program of old age and survivor's insurance and unemployment compensation should be provided within the framework of a free economy. Extension of such programs is desirable. The objective should be to provide a minimum layer of basic protection, leaving ample room for individual thrift.

TAXATION

that national taxes should be levied only to cover the cost of necessary services to be performed by the national government. Taxes are improper as a means of social reform or objectives beyond the realm of essential government activities. While large revenues are essential in the position in which we find ourselves they should be sought with a minimum of braking effect on production, trade, venture capital and individual incentive.

Metalworking executives interviewed by STEEL voiced the above declarations of policy. While there is by no means unanimity among businessmen, the editors believe these to be a fair consensus.

NEA

For the individual and for his company . . .

Suggestion Plans Pay Off

Management and workers reap rewards as 6000 companies adopt idea-producing systems. Suggestions save time, material and expense

A MIDWESTERN manufacturer received this note in his suggestion box: "Do away with the suggestion system."

Are suggestion systems worthwhile? The answer, according to a STEEL survey on the subject: Yes, if they're run right. Proof is that about 6000 American companies operate them now. Most say they pay off in dollars and cents, but all believe they're invaluable in maintaining employee morale.

Solid Statistics—General Motors Corp. awarded $1,516,500 to workers for helpful hints in 1951 and paid out $1,678,000 in 1952. Some 144,890 suggestions were made by GM employees last year and 33,863 were adopted.

A Pittsburgh industrial instrument manufacturer states that his production costs have scarcely risen since 1935, when employees were first asked for suggestions. He estimates that improvements save his company about 4 per cent of its operating costs each year.

Suggestion Techniques—Methods of running a suggestion plan have come a long way since 1880 when a Scotch shipbuilder, William Denny, is credited with starting the first system, a simple suggestion box. Lukens Steel Co., Coatesville, Pa., distributes printed suggestion forms at clock stations throughout the plant. A suggestion committee assigns a number to each proposal and considers them anonymously. Ideas are tested immediately, and employees informed of the workability of their suggestions.

A simpler plan is to persuade workers to discuss ideas for bettering production with their foreman. Frequently savings resulting from these suggestions are passed along to the individual worker. More often the entire workforce benefits from extra company profits.

Individual Status—Another technique is appealing to the worker's pride. At plants of Crucible Steel Co. of America, New York, photographs of award-winning employees are posted on bulletin boards, under the caption "Award Winner." Ford Motor Co. believes its system is unique in giving recognition and promotion consideration to white collar and management workers as well as to hourly employees for the proposals.

Best suggestions are those which save material or labor through changes in methods. At Lukens the proposal of a jig to grind blanks, so they would meet tolerances instead of being rejected, was judged the best idea of the month. It was worth $292 to the Lukens employee who submitted it.

Attitude—The employee's attitude governs success or failure for the suggestion plan. One manufacturer remarks, "We try to create a state of mind where the worker won't be satisfied with his technique when he can think of a better way to do his job. By so doing he helps his company and eventually helps himself." If workers aren't interested in bettering conditions of work, the suggestion project is doomed.

A New Jersey manufacturer was discouraged to find that his suggestion plan was not taken seriously by employees. Acceptable proposals were few and far between.

Workers who joke about the suggestion box would be astounded by the prompt attention their ideas receive. Edwin L. Wiegand Co., Pittsburgh, analyzes all suggestions it receives, although the company finds only 28 per cent are usable.

National Group—There is even a National Asociation of Suggestion Systems, in Chicago. This nonprofit organization of about 700 manufacturers works to make suggestion programs more valuable to industry. Growing number of companies employing such systems is proof, it says, that such plans are paying off. The suggestion box has earned its place in industry.

Founders Hold Redesign Contest

Cash awards of up to $500 await the winners of the fourth annual Redesign Contest announced by the Gray Iron Founders' Society Inc., Cleveland. Any person in the metalworking industry may enter by redesigning a competitive product for production in gray iron.

Entries must be submitted by May 1, 1953, and will be judged by the society's advertising committee. Awards will be made at the 25th Anniversary Meeting in St. Louis in October.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Bright business prospects for 1953 include greater outlay for industrial building. Personal income and auto production rise, Sinclair Weeks reports

THE GENERAL level of business in the first quarter of 1953 has been higher than in the closing quarter of 1952, and business leaders who comprise the membership of the Commerce department's Business Advisory Council express "solid confidence" in the business outlook, according to Secretary of Commerce Sinclair Weeks in his first press conference.

Bright Prospects—While reporting that business prospects are good, he forecast capital expenditures for new industrial plants and equipment this year at a rate somewhat higher than last year's level of $26.5 billion (see p. 45). Personal income of Americans, he said, is at an annual rate of $280 billion, or about $3.5 billion over the fourth quarter rate.

Production of automobiles and trucks in the first quarter will come to about 1,850,000 units, or 560,000 more than in the first quarter of 1952.

Business Loans—What about the future of government loans to business? In answer to this question the secretary thought the Reconstruction Finance Corp. as presently functioning should be abolished, but he personally believed some sort of loan service for small business should be continued. Administration policy on this subject, he said, has not yet been fixed.

Continues T-H Study . . .

If the roster of witnesses who have appeared before the House Committee on Education and Labor to state their views on the Taft-Hartley Act is a gage, then there is not much dissatisfaction over this law or the manner in which it will be amended among employers.

Of approximately 60 witnesses who have appeared to date, the great majority have been officials of labor unions, interested members of Congress, former and present members and counsel of the National Labor Relations Board.

While the national associations of employers have done a fine job to date in setting forth industry's views on Taft-Hartley, the over-all presentation could be more effective if individual manufacturers informed the committee about their particular experiences and pointed out needed amendments to the law.

Bureau for Small Business . . .

H. Res. 4090, introduced by Chairman William S. Hill (Rep., Colo.), House Small Business Committee, would create a permanent Small Business Administration. It would replace and absorb all the small business functions of the Small Defense Plants Administration, now slated to expire June 30. The bill definitely provides for government loans to small business.

Speeding Color TV . . .

Following its request to the National Production Authority to revoke immediately its ban on use of critical materials to make color TV receivers, the House Interstate and Foreign Commerce Committee has started hearings to determine what can be done to speed color television to the public.

Study Effects of Moisture . . .

Effects of moisture attacks on steel within buildings is one of the subjects to be included in a report of the Building Research Advisory Board's Committee on Condensation Control in Buildings. The report is to be completed by a subcommittee by July 1 and submitted to the full committee on Sept. 18.

The report will assemble accepted tests and standards on condensation, develop recommended practices for installation of products, and determine the priority of needed further research.

LAWS LOSE THEIR LOGIC
. . . vagueness confuses legislators

Laws Become Too Complex . . .

Enforcement of much federal law has become a matter of individual interpretation rather than legislative intent, says Senator William Langer (Rep., N. Dak.). This has resulted in a "mushrooming complexity of federal law, much of it obscure or antiquated and inadequate to present-day conditions."

To study this situation and outline a remedy, he appointed as general adviser to his Senate Judiciary Committee, William B. Ziff, chairman of Ziff-Davis Pubishing Co. of New York and Chicago. Mr. Ziff, in addition to being a well-known author and publisher, long has served as unofficial adviser on economic and foreign affairs to members of Congress.

To Strengthen Trade Policy . . .

Lewis W. Douglas, once director of the budget and former ambassador to the United Kingdom, will head a presidential committee to assist in working out a sound foreign trade and economic policy. The committee, whose membership has not been determined, is to ascertain what foreign trade and aid mean to the United States in terms of dollars, business volume, tax collections and employment and raw materials and commodities we must import.

Here's the difference between Hydroforming and conventional deep drawing

CONVENTIONAL METHOD

Fig. 1 shows the forming of a hemisphere with a standard draw die equipped with a die cushion.

For satisfactory drawing, an accurately controlled, infinitely *variable* blank holding pressure during the drawing cycle is most desirable and such a feature is rarely available on conventional presses.

Conventional tooling requires that the material be drawn over a fixed die radius. A very small die radius may cause spot stresses, thin-out and tearing. A very large die radius may cause wrinkles and puckers to be formed in the part.

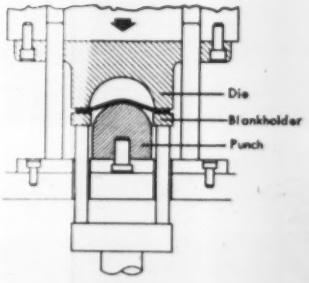


Figure 1

HYDROFORM METHOD

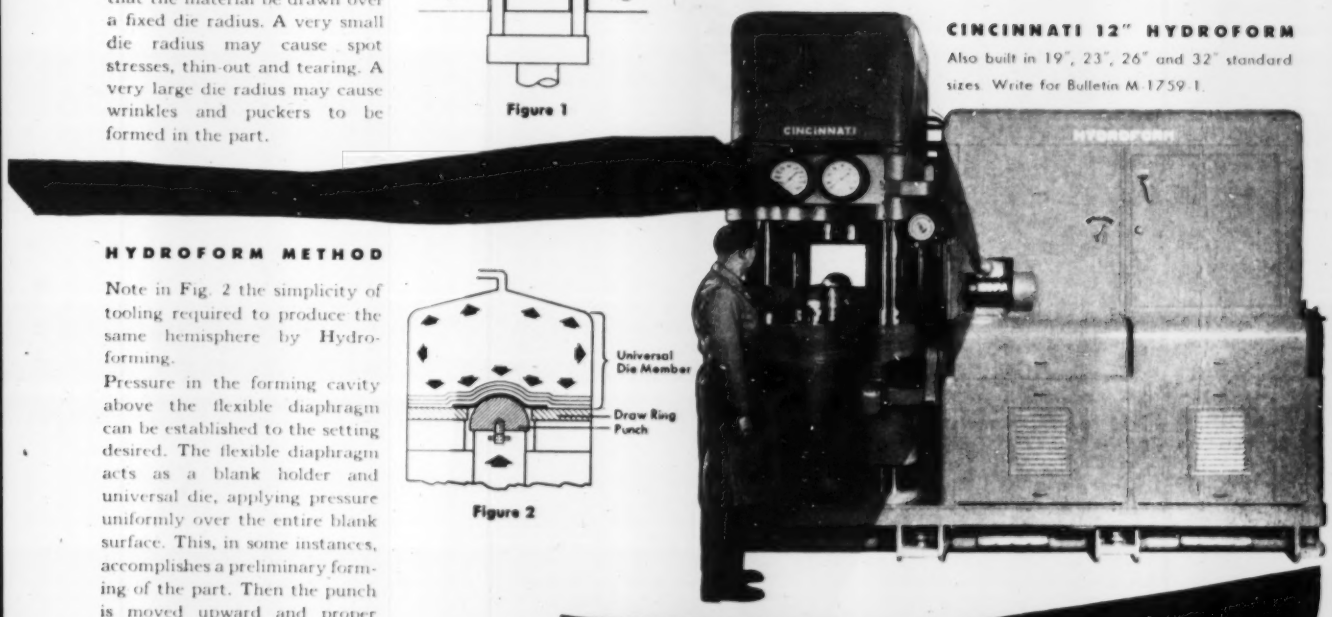
Note in Fig. 2 the simplicity of tooling required to produce the same hemisphere by Hydroforming.

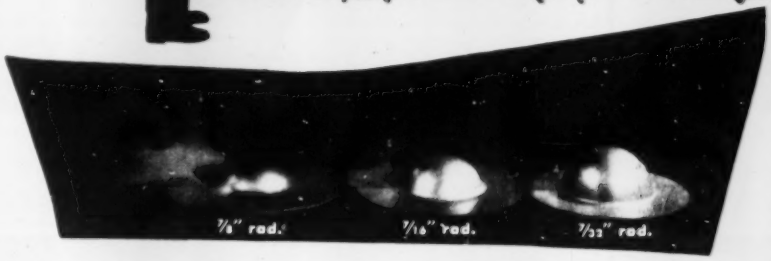
Pressure in the forming cavity above the flexible diaphragm can be established to the setting desired. The flexible diaphragm acts as a blank holder and universal die, applying pressure uniformly over the entire blank surface. This, in some instances, accomplishes a preliminary forming of the part. Then the punch is moved upward and proper control of the pressure in the forming cavity forms the material to the punch.

The forming cavity pressure normally increases throughout the draw, causing the forming or draw radius to decrease progressively, as shown in the photo at right. This transition of the radius from large to small facilitates the "flow" of the material. Those portions of the blank which have been formed are held firmly in contact with the punch, preventing further stress or strain in those areas. The continuous wrap-around action of the flexible die member, plus the accurately controlled forming pressure, produces consistently uniform parts, free from the defects described above.

Figure 2

CINCINNATI 12" HYDROFORM
Also built in 19", 23", 26" and 32" standard sizes. Write for Bulletin M-1759-1.



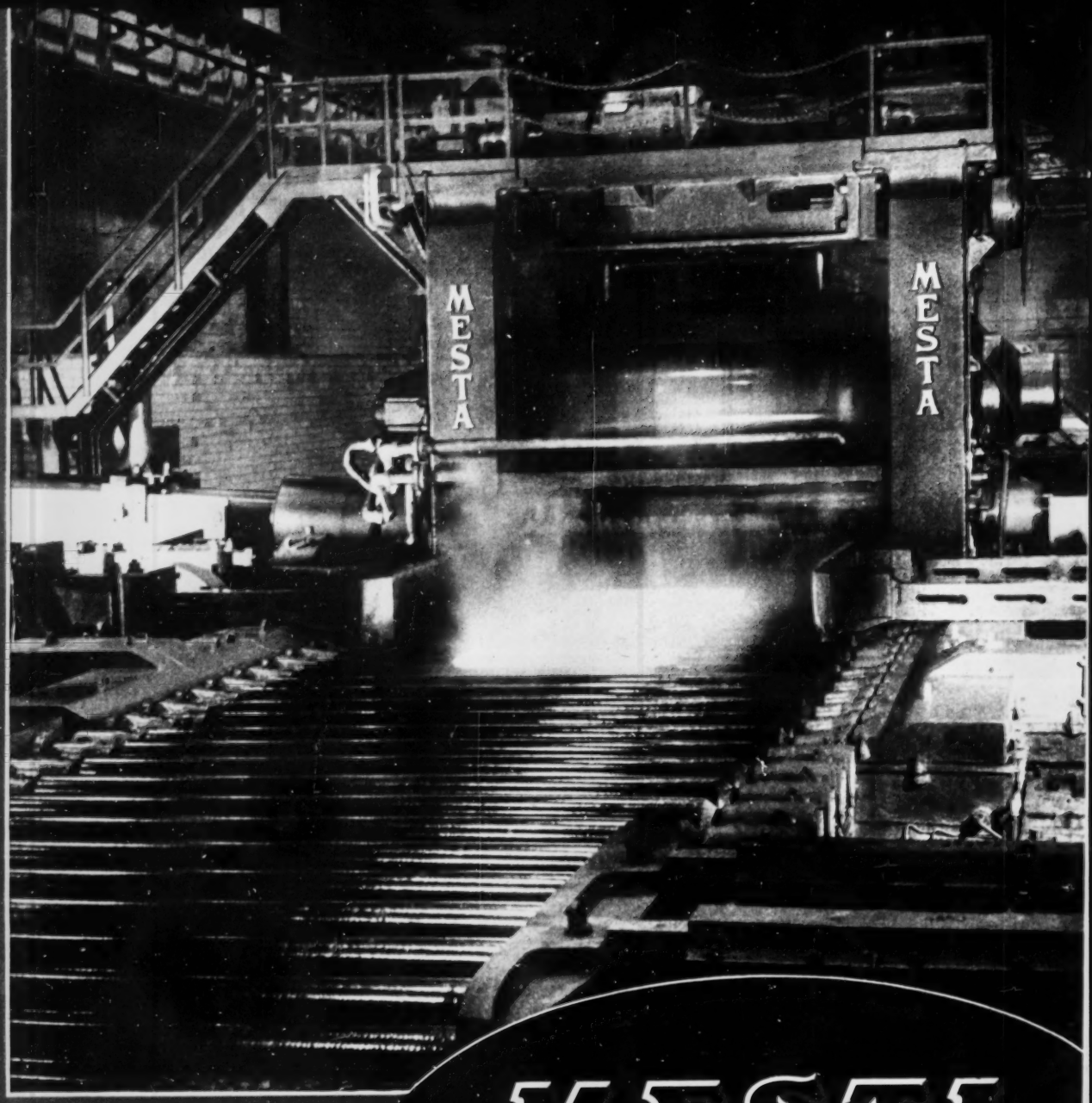


Can you convert the advantages of Hydroforming into production profits?

Through Hydroforming, deeper draws and more intricate shapes can be formed in one operation than is possible by conventional forming methods. Tool costs are reduced 50% or more. Part quality is materially improved. Short-run production is made exceptionally economical. Can you apply these Hydroforming advantages to your production? Call in a Cincinnati Milling field engineer.

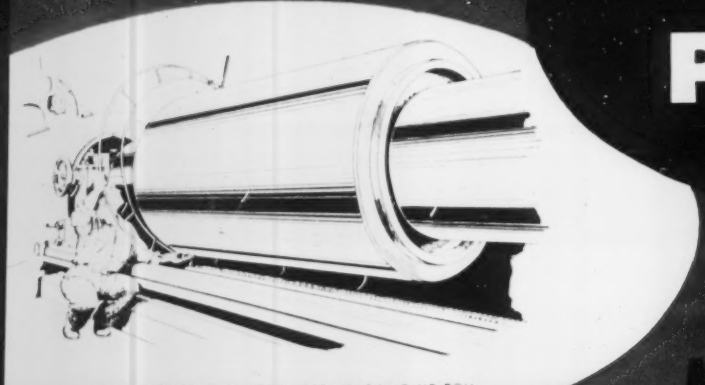
CINCINNATI Hydroform

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U.S.A.



MESTA 126" FOUR-HIGH
REVERSING PLATE MILL

MESTA
PLATE MILLS



FINISH GRINDING A LARGE MESTA BACKING UP ROLL
IN A MESTA HEAVY DUTY ROLL GRINDER

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

GERMAN STEEL TRENDS

(NET TONS)

	1952 IMPORTS—UP				1952 EXPORTS—DOWN			
	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER
Semifinished steel	2,750	9,900	79,500	70,700	6,400	3,100	9,400	1,400
Hot-rolled bars	14,400	16,600	67,200	212,600	101,800	86,500	84,700	62,400
Hot-rolled hoops	3,200	3,300	11,100	27,200	16,900	13,000	12,100	8,600
Sections	8,300	11,100	22,600	64,700	60,900	50,500	39,900	41,500
Wire rods	5,100	15,100	25,700	30,700	41,900	28,400	17,500	14,700
Rails	330	990	660	12,100	30,100	27,000	32,300	30,000
Heavy plates	3,300	3,400	16,000	53,700	55,200	40,800	33,800	33,200
Medium plates	1,100	1,500	3,500	23,000	14,400	9,600	5,600	4,600
Thin sheets	3,400	6,500	21,300	34,700	60,500	36,200	23,400	15,200
TOTAL	41,800	68,500	247,600	529,400	388,200	294,900	258,830	211,640

All figures are rounded.

Steel Trends Reverse in Germany

Something new: Germany has become a net-importer of steel. Even finished goods exporters are finding tougher competition. German steel producers are slowly awakening

GERMAN steel producers are jittery over the growing steel import trend in that country and slipping exports (see table above).

This unprecedented situation results from a reluctance to reduce prices in Germany and price cuts by other Schuman plan countries. While not all the problems of the Schuman plan pool have been worked out, Belgium and France have been able to shade prices with the dropping of some trade barriers under the plan. France especially is making a strong effort to increase steel imports at the expense of German producers.

Slow Orders—German capital goods industries are finding tough buyer's conditions abroad, too. Orders are being booked at about one-half to one-third below last year's rates, particularly in machinery and motor vehicles. A new upsurge of orders is expected from the current automobile show at Frankfurt at which Opel, German subsidiary of General Motors Corp., has displayed a new low-priced (about $1480) car (see the photo).

Another feature of the German iron and steel trade is the decline of U. S. coal imports. Only 165,000 tons of steel were produced with U. S. coal in February, 1953, about 100,000 tons less than the average during the last quarter of 1952. The same decline is noticeable in pig iron production which is depending less on U. S. coal.

Slow Shift—The shift from steel shortages to plentiful supply as a result of greatly expanded European capacity and effects of the Schuman plan, while slow dawning on German producers, is making itself felt now. A straw in the wind is the resumption of German export offers: Steel bars are currently being quoted at about $86 f.o.b. for export, nearly $10 below German inland quotations.

More price reductions can be expected after May 1, the deadline for the uniform iron and steel market of Montanunion.

Off-Shore Pickups

The House of Commons voted 304 to 271 to denationalize the British steel industry. Now the bill goes to the House of Lords, where the heavy Conservative majority assures easy passage. . . Three electric pig iron smelting furnaces will be ready to start production by the end of 1953 at Norway's Mo i Rana steel works. Electric steel-producing furnaces are being installed at the plant which are expected to begin operations in the summer of 1954. . . The French General Wireless Co. has registered a new company, Precision Ceramics Inc., at Bedford, Mass., in association with Aerovox Co. for the manufacture of condensers and electronic spare parts. . . French steel exports increased from 121,000 tons in December, 1952, to 182,000 tons in January, 1953. Total steel sales were 683,000 tons in January.

United Press

The Opel plant at Russelheim, Germany, a General Motors subsidiary, unveiled a surprise car for the International Auto Show in Frankfurt. It's the "Olympia Rekord," with a 40 hp engine and a top speed of about 70 miles per hour

Specify

N-A-X
HIGH-TENSILE STEEL

BUMPER FACE-BAR

for

High Strength and Impact Resistance with Excellent Cold-Formability

N-A-X HIGH-TENSILE, having 50% greater strength than mild carbon steel, permits the use of thinner sections—resulting in lighter weight of products. It is a low-alloy steel—possessing much greater resistance to corrosion than mild carbon steel, with either painted or unpainted surfaces. Combined with this characteristic, it has high fatigue and toughness values at normal and sub-zero temperatures and the abrasion resistance of a medium high carbon steel—resulting in longer life of products.

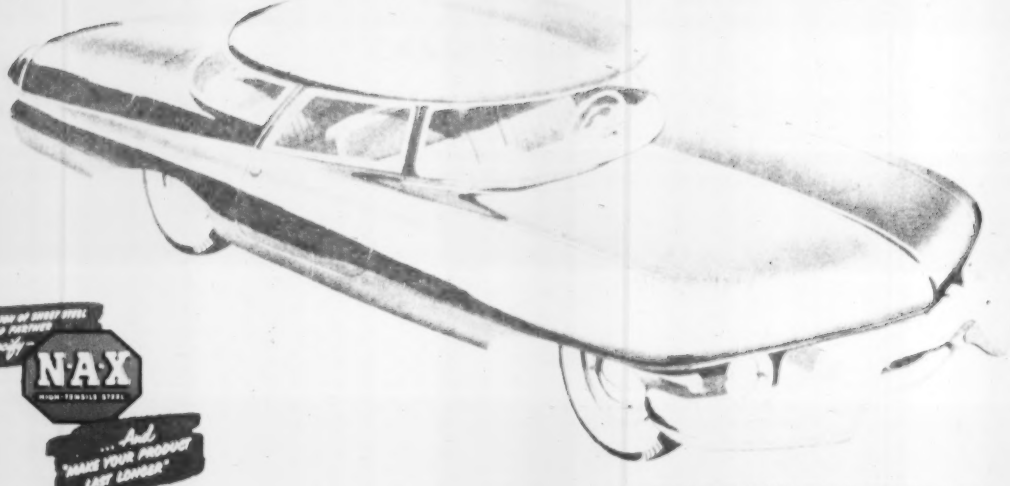
N-A-X HIGH-TENSILE, with its higher physical properties, can be readily formed into the most difficult stamped shapes, and its response to welding, by any method, is excellent. Due to its inherently fine grain and higher hardness, it can be ground and polished to a high degree of lustre at lower cost than can mild carbon steel.

Your product can be made lighter in weight . . . to last longer . . . and in some cases be manufactured more economically, when made of N-A-X HIGH-TENSILE steel.

GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division — Ecorse, Detroit 29, Mich.

NATIONAL STEEL CORPORATION

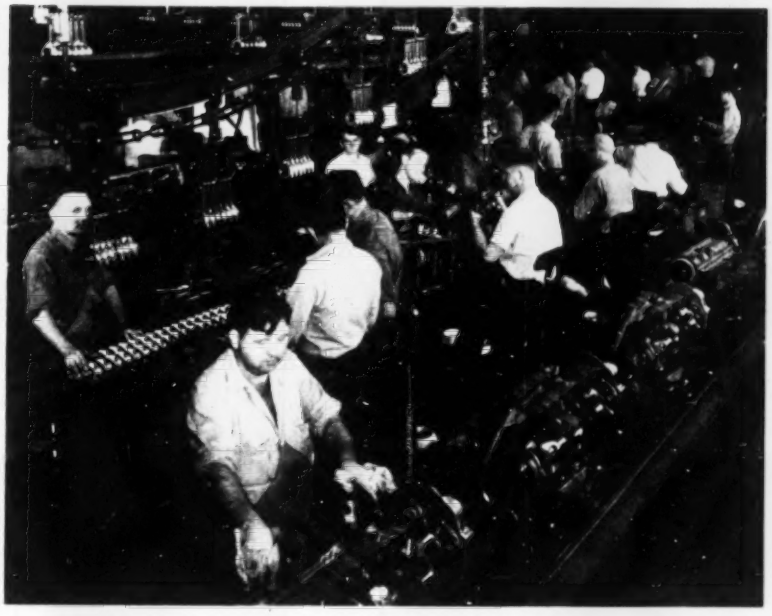


Specify N-A-X HIGH-TENSILE STEEL ... And "MAKE YOUR PRODUCT LAST LONGER"

KEEP YOUR SCRAP MOVING TO YOUR DEALER

By FLOYD G. LAWRENCE *Detroit Editor*

Mirrors of Motordom



Changes are coming on the Chevrolet-Flint line because . . .

By 1956, production of six-cylinder automobile engines will be a shadow of its former self as the overhead valve V-8 takes over. Even K-F and Hudson may be in the show

DETROIT

BY 1956, Chevrolet, Ford, Mercury, Packard, Pontiac and Plymouth will offer overhead valve V-8 engines. Only Willys, Kaiser and Hudson appear to be lagging the V-8 push and the betting is dollars to bankruptcy they'll be getting into line.

Though the Hudson Six as modified for stock car racing (or police use) puts out over 190 horsepower, many in the trade feel the Hornets will have to get that V-8 stinger if they're to maintain their stock car racing superiority. If it takes two engines per car, Hudson is going to stay in front. So the racing forms hold the key to Hudson engineering and chances are good there will be a Hudson V-8 by 1956 post time.

Everybody in the Act — Kaiser, though quiet on the subject, is not likely to lag behind. When the firm completes its purchase of Willys as appears virtually certain, every auto firm will be offering an overhead V-8 in some of its models by 1956.

This prospect is of neck-snapping interest to metalworking men in more ways than acceleration, for the key to the new V-8 engine craze is tooling.

It's no secret that Mercury first planned to have its ohv V-8 in the dummy air scoop special of two years ago. Now it looks curbside by October. So firms like Packard, still trying to decide between four V-8s now whizzing around its Utica, Mich., test track, are going to have to get things in the works pretty fast now or eat dust.

Here's Why — The reason is simply this: Automotive tool building firms in the Detroit area are up against the biggest order backlogs in many years. Ex-Cell-O Corp., builder of transfer machines, reports that from engineering to plant for the average piece of equipment takes about 18 months. Other builders report backlogs for smaller pieces of equipment in the 20-30 week bracket, heavy items run from 40 weeks on up. All say they see heavy business for at least the next two years, and all report the auto companies are snapping at their heels daily.

Chevrolet is a good example. Its new V-8 engine plant is closed in at the Flint construction site and the firm has moved up production plans to 1954 as reported in this column some weeks ago rather than 1955. That spells pilot model production by midyear if tooling doesn't stand in the way. Consequently, tool suppliers involved are being pushed for assurances that Chevrolet won't have an empty air scoop in 1954.

At least enough V-8s to fill the Bel Air series engine cavities seem assured, probably as optional equipment.

More Coming Up—Such firms as Buick and Dodge are ordering more tooling to up V-8 engine production, and that adds heavily to the order backlog. Equipment to build more and better automatic transmissions is being ordered by the automakers as well, along with power steering, etc. The toolmakers love it, but they do wish it would be stretched out a bit.

A big reason it can't is the way an automaker tools for a new engine. Take Chevrolet, once again. Currently the firm is making its overhead-six at Flint. The milling, boring, drilling, tapping and lapping machines are lined up in batteries. Roller conveyors pass the blocks to an empty machine performing the operation required. The setup makes six-cylinder engine blocks like a hot skillet turns out popcorn. It is difficult for the layman or Chevrolet engineers to visualize it doing anything else.

Expensive Proposition—As a result, when Chevrolet starts V-8 production, it will start with a brand new layout in its new building at Flint. Revamping the existing facilities would be a costly and impractical proposition, and that's a factor in why Chevrolet's six has

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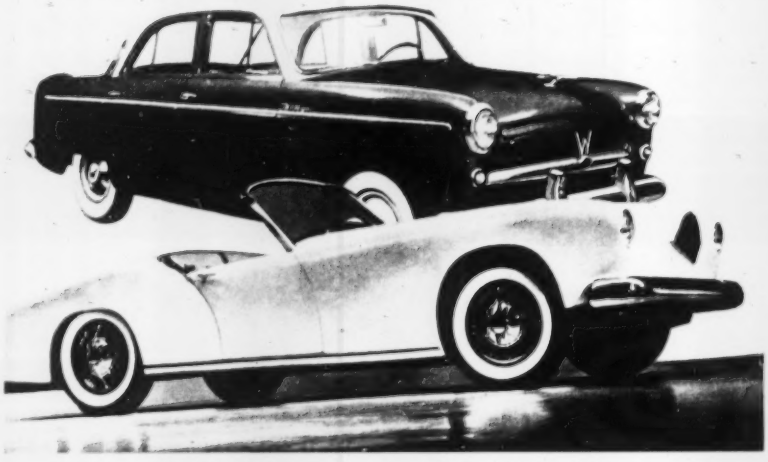
remained basically unchanged since the date it was introduced. When it switched from the four cylinder job to the six about 1929, Chevrolet started from scratch, too. Changes in the number of cylinders and style of block require all new equipment and production can't be stopped for the changeover. Automakers estimate they don't even get their tool and die changes paid for until a model has been in production six months.

Equipment to produce the new Chevrolet V-8 will undoubtedly make the automation headlines. Known to be involved is a pedestal-type motor assembly conveyor which transcends the wooden-block conveyor thinking now used in the six. Automation in the transfer machines doing the block machining is bound to run high and will embody the unwritten Chevrolet theme of utilizing principles that are proven.

Tried and Proven—A week spent driving a Chevrolet "210" series sedan leads to this evaluation of the firm. Chevrolet adopts features as they are proven and accepted, is extremely careful not to go out on a limb mechanically or stylewise. Pickup with the Power Glide unit usually doesn't put you away from a traffic light first. On the other hand, you're seldom last either. At speeds above 65 miles an hour the car gives an uneasy sensation of floating like most light cars, but in the normal driving ranges of 50-60 the car handles beautifully and holds plenty in reserve. Interiors belie the Chevrolet price tag and riding qualities are surprisingly good.

Particularly impressive in the manufacture was the engine assembly. Pistons are weighed and sized prior to fitting to air gaged cylinders by hand. Connecting rods are sorted by weight and when the engine is assembled it is run in for about half an hour with an electric motor while flushed with oil to remove loose metal particles.

Thorough—Then the engine is disassembled and all bearing surfaces are inspected. Finally the engine is reassembled and run under its own power for another half an hour or longer. This technique is probably not unique to Chevrolet, but insures lasting quality in these low-priced engines.



Willys and Kaiser models pose together as . . .

Kaiser-Frazer Purchase of W-O Appears Certain

Billed in the rumor mart for weeks as a "merger," the K-F and Willys deal now turns out to be a purchase by Kaiser-Frazer Mfg. Corp. of Willys-Overland Motors Inc. Price is estimated at $62.3 million, which includes the assumption of certain liabilities of Willys.

The new corporation is expected to be known as Willys Motors Corp. Ward M. Canaday, president and chairman of Willys-Overland, has been invited to become president and chairman of the new firm. It is expected that R. R. Rausch will become executive vice president.

Benefits expected from the plan include mutual purchasing, better utilization of tools and equipment and savings in tools and overhead. Facilities of the two firms complement each other to an unusual degree. Willys forging will definitely prove a boon to Kaiser, while the body shop of Kaiser will do likewise to Willys.

Consolidated balance sheet of K-F with the purchase shows total assets exceeding $200 million and working capital in excess of $60 million. This funding places the infant in fourth place moneywise though production will have to earn the firm the spot on the market. Sales will still be handled independently through existing organizations, and a consolidated auto line one of these days seems a logical assumption, though nothing has been announced on the subject. W-O stockholders are expected to approve the purchase Apr. 24.

Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,829	424,559
February	623,530*	464,557
March		525,024
April		570,464
May		542,559
June		542,478
July		226,134
August		322,755
September		595,715
October		656,767
November		548,782
December		569,715
Total		5,989,509

Week Ended	1953	1952
Feb. 21	161,860	110,542
Feb. 28	167,779	118,397
Mar. 7	158,825	115,126
Mar. 14	165,762	120,392
Mar. 21	169,128	125,347
Mar. 28	170,000*	132,850

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary

Exhaust Notes

The Mercury ohv V-8 to be introduced around October will produce 145 hp. Also embodied in the new models will be a strikingly lower hood line made possible by the lower overall engine height.

From the experience of building

NEARLY 8,000,000 *Maytag* WASHERS

get the mo$t for your Zinc Die Ca$ting Dollar!

In building nearly 8 million washers since 1907, The Maytag Company has always maintained dependability through top quality. The Maytag Master model of the wringer-type machine, first built in 1939, has always utilized ZINC Die Cast operating components and those in the current model typify the advantages of this metal and method of production.

ECONOMICAL, TROUBLE-FREE ASSEMBLY

Examine these six ZINC Die Castings from the standpoint of complexity of shape and you will realize why, by any other means of manufacture, a greater number of parts would be required to serve the same purpose. An absolute minimum of machining is required to prepare these castings for assembly and their dimensional accuracy assures perfect fit every time.

STRENGTH AND BEAUTY

The unusual castability of ZINC Alloy permits section thickness to be varied in proportion to the stresses imposed. Thus, these castings are thick only at vital points, to provide maximum strength with a minimum amount of metal. From an appearance standpoint, the smooth as-cast surfaces of the ZINC Die Castings are economically finished with a beautiful baked white enamel.

In selecting a die casting alloy there are many factors both physical and mechanical to be considered in addition to the base price of the metal. Ask any commercial die caster about the advantages of ZINC Die Castings —or write to us.

Send for your copy

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FOR DIE CASTING ALLOYS

The Research was done, the Alloys were developed, and most Die Castings are based on

HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

"Our railroad bridge is an

EYE OPENER

for anybody with an assembly problem"

"Whether you're assembling toasters or bridges," Ken went on, *"it pays to set your sights on fasteners."*

"Fasteners?" asked Jack.

"Right!" affirmed Ken. *"We've saved plenty by taking the RB&W man's advice to switch from rivets to high strength RB&W bolts in assembling high stressed structural joints.*

"These bolts stay tight and that saves us maintenance. They assemble faster, and that saves us labor and construction time."

There's a cost-cutting lesson for you in this story, whatever your industry.* So look to your fasteners for an often overlooked opportunity to reduce costs, and strengthen your competitive position. New inventions, like RB&W's SPIN-LOCK Screw, may prove more efficient than the fasteners you're now using.** Or you may save by the stepped-up production you get from using the finest fasteners... RB&W bolts, nuts, rivets and screws of uniform accuracy, dependability and physical properties.

Let RB&W help you make the most efficient use of fasteners on your assembly line. Address RB&W at Port Chester.

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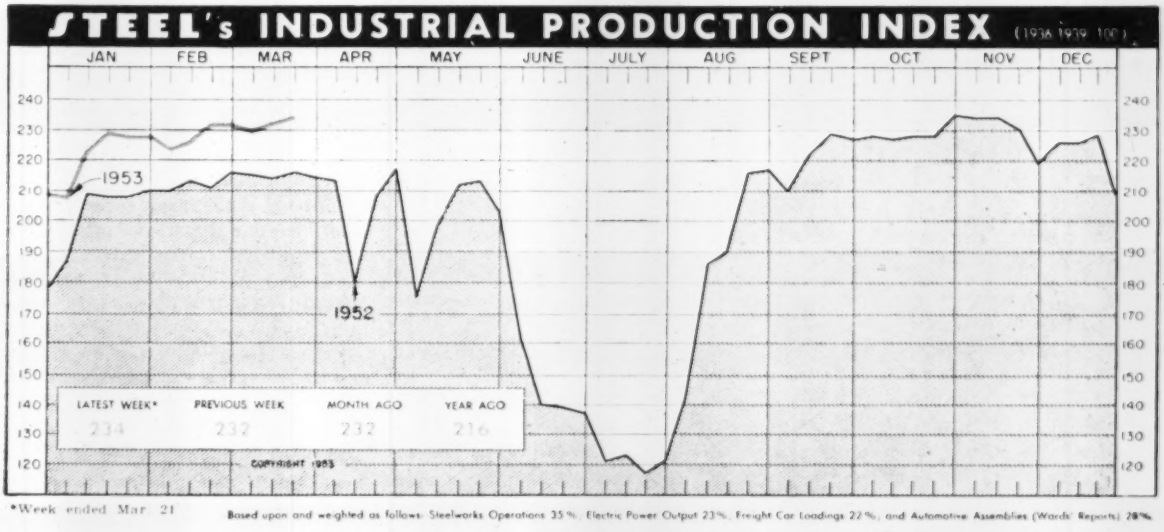
R B & W

108 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

*If you're interested in construction, write R B & W at Port Chester for the free booklet, "High-Strength Bolts."

**New SPIN-LOCK Catalog is in the Product Design File. Write for extra copies.



*Week ended Mar. 21

Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automotive Assemblies (Wards' Reports) 20%

The consumer durables industry is watching like a hawk today's high consumer demand. Many promotion techniques are used to smoke out civilian dollars. Index edges up

METALWORKING companies turning out consumer goods might well wonder how long the public will keep its purchases at today's high levels. Fact is, any slight dip in the demand for metal consumer products is certain to slow many production lines.

Here's why: The metalworking industry after the steel strike bent every effort to restore depleted inventories. When this was accomplished, strong consumer demand supplied the boost to industrial production as defense orders leveled off. The Commerce department says that retailers in February rang up a $12.5 billion sales volume, the highest monthly total in history. All retail sales in February rose 7 per cent over the year, while sales of durables jumped 14 per cent above February, 1952, to $4.4 billion.

Range Sales Hot — Enjoying a considerable boom in sales are manufacturers of household durables. The National Electrical Manufacturers Association says that factories in January sold 108,145 household electric ranges, or 34 per cent over unit-sales in January, 1952. Refrigerator sales in the first month in 1953 totaled 325,186 units, about 24 per cent over a year earlier.

Indications are that sales of heavy appliances are still well above this time, a year ago. The University of Michigan's Survey Research Center working for the Federal Reserve Board says that most persons believe that now is a good time to buy a new refrigerator, range or dishwasher. The research center in past years has had considerable success in gaging market demand. Manufacturers and retailers are at present busy fostering this favorable public attitude.

Many Promotions—Newspapers, radio and TV programs are brimming with promotional techniques calculated to smoke out more consumer dollars. To lure buyers for freezers, food is being offered at wholesale prices to those people, extra large screens go to purchasers of TV sets and practically everybody is offering the lowest installment credit terms in many years. Nevertheless, consumer demand is tricky; only the next few months will tell whether this renewed emphasis on sales will keep output at near-record levels.

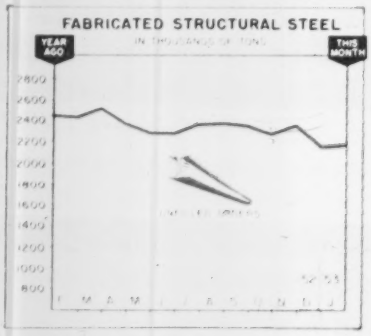
Index Rising—As consumer production booms and defense demand remains high, most indicators of industrial activity are at record or near-record levels. STEEL's production index in the week ended Mar. 21 rose 2 points to 234 per cent of the 1936-1939 average. Steel and automotive operations continued to move upward, and electricity production remained about 9 per cent over the comparable 1952 week. Only freight car loadings in the week ended Mar. 21 lagged under the same period in 1952.

Steel Production Surging . . .

Steel production is breaking previous records nearly every week. The American Iron & Steel Institute says that furnaces in the week ended Mar. 21 poured 2,288,000 net tons of steel for ingots and castings. That's the third consecutive week that previous output records were broken. Estimated for the week ended Mar. 28 is a steel turnout of 2,259,000 net tons.

Auto Goals Raised . . .

The passenger car industry, challenged by strong demand, is striving to roll out as many vehicles as possible. Total output in the first three months of 1953 will reach 1.5 million passenger autos, *Ward's Automotive Reports* estimates. Predicted for the April-June period

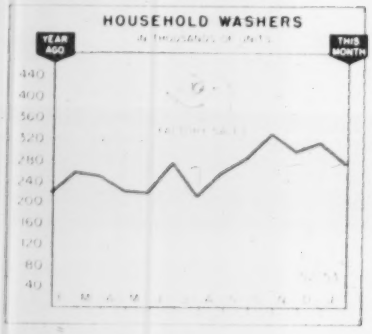


Fabricated Structural Steel

Thousands of Net Tons

	Shipments		Backlogs	
	1953	1952	1953	1952
Jan	234.2	241.9	2,480	2,416
Feb		246.4		2,408
Mar		268.8		2,501
Apr		230.7		2,359
May		244.2		2,263
June		125.6		2,261
July		138.3		2,361
Aug		226.3		2,363
Sept		227.6		2,342
Oct		261.7		2,266
Nov		222.6		2,347
Dec		224.2		2,153
Total		2,661.3		

American Institute of Steel Construction

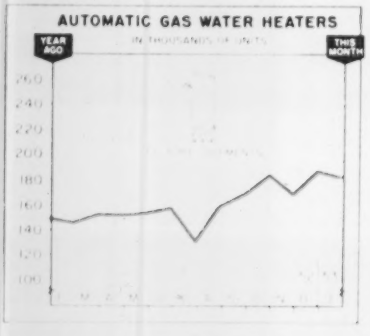


Household Washers

Sales Billed Units

	1953	1952	1951
Jan	277,309	213,998	321,062
Feb		255,864	311,325
Mar		248,431	368,466
Apr		217,211	292,193
May		213,668	253,942
June		274,457	253,119
July		267,593	139,709
Aug		254,537	229,081
Sept		283,732	313,756
Oct		327,814	297,210
Nov		293,079	262,484
Dec		310,661	218,864
Totals		3,191,045	3,301,123

American Home Laundry Mfrs. Assn.

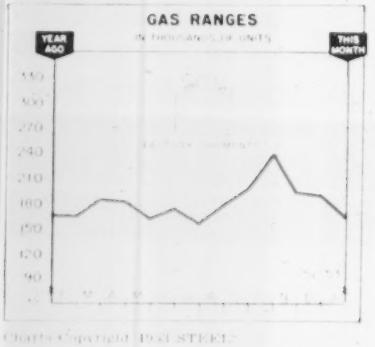


Automatic Gas Water Heaters

Shipments in Units

	1953	1952	1951
Jan	183,100	148,700	225,600
Feb		145,300	213,100
Mar		153,300	223,300
Apr		143,300	199,100
May		155,300	167,100
June		150,000	131,500
July		131,300	102,100
Aug		161,500	124,100
Sept		171,200	139,900
Oct		185,300	148,800
Nov		167,100	143,100
Dec		188,200	127,200
Total		1,920,000	1,937,700

Gas Appliance Mfrs. Assn.



Gas Ranges

Shipments in Units

	1953	1952	1951
Jan	196,900	166,100	260,600
Feb		166,200	254,000
Mar		183,200	284,500
Apr		182,300	224,000
May		192,300	177,500
June		175,500	128,500
July		161,200	116,100
Aug		178,500	168,100
Sept		199,600	134,600
Oct		229,700	210,000
Nov		196,100	182,200
Dec		190,600	149,500
Total		2,182,400	2,356,100

Gas Appliance Mfrs. Assn.

Charts Copyright 1953 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Feb. 23	Gray Iron Castings	Mar. 16	Radio, TV	Feb. 2
Durable Goods	Mar. 9	Ironers	Mar. 9	Ranges, Elec.	Feb. 2
Employ. Metalwk.	Jan. 19	Index, Production	Feb. 16	Refrigerators	Feb. 2
Employ. Steel	Dec. 15	Machine Tools	Mar. 23	Steel Castings	Mar. 16
Foundry Equip.	Mar. 23	Malleable Castings	Mar. 16	Steel Forgings	Mar. 16
Freight Cars	Mar. 23	Prices, Consumer	Jan. 26	Steel Shipments	Nov. 3
Furnaces, Indus.	Feb. 2	Prices, Wholesale	Jan. 26	Vacuum Cleaners	Mar. 23
Gear Sales	Mar. 9	Pumps	Feb. 16	Wages, Metalwk.	Mar. 9

are an additional 1.8 million units, bringing the first-half total to around 3.3 million passenger cars, or the second largest half-year production in motordom's history. Only the 3.5 million autos produced in the second half of 1950 surpasses this projected turnout.

The big question-mark hovering over the automotive scene is the steel situation. Steel in hot-rolled and cold-rolled sheets and bar stock is fist-tight and could curtail production at a point well under the industry goal. Yet trade circles, according to *Ward's*, foresee a brighter steel picture with new mills and increased steelmaking facilities lessening the shortages. Automakers at present are scurrying for every available pound of metal they can find, and, in some instances, production lines have been halted due to lack of steel.

Most assembly lines, however, are running at near full-tilt. U. S. and Canadian plants in the week ended Mar. 21 completed 169,128 passenger cars and trucks. Not since March, 1951, has this output level been surpassed. Combined U. S.-Canadian production in the week ended Mar. 28, estimates STEEL, totaled 170,000 passenger autos and trucks.

Employment Pushes Up . . .

As industry's pace quickens, employment continues on an upward path, with the number of jobless at unusually low levels. The Bureau of the Census says that employment in mid-February rose 100,000 above the January level to 60.9 million, compared with 59.8 million persons employed in February, 1942. Nonagricultural employment last month increased 500,000 persons to 55.6 million workers, the highest monthly total on record and exceeding that of a year earlier by 1.9 million employees. Manpower continued in short supply in February with only 1.8 million persons, or 2.9 per cent of the total workforce, looking for jobs.

TV Shipments Heavy . . .

With demand at near-record levels, manufacturers are rushing TV sets to dealers as quickly as possible. Radio-Television Manufacturers Association says that dealers in January received 695,087

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	101.0	101.5	100.5
Electric Power Distributed (million kwhr)	8,100[3]	8,138	7,354
Bituminous Coal Output (daily av.—1000 tons)	1,404	1,350	1,623
Petroleum Production (daily av.—1000 bbl)	6,530[3]	6,550	6,423
Construction Volume (ENR—millions)	$312.1	$266.2	$250.8
Automobile, Truck Output (Ward's—units)	169,128	165,762	125,247
TRADE			
Freight Car Loadings (unit—1000 cars)	705[3]	700	720
Business Failures (Dun & Bradstreet, number)	160	165	181
Currency in Circulation (millions)[4]	$29,708	$29,780	$28,361
Dept. Store Sales (changes from year ago)[5]	+ 11%	+ 9%	10%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$19,450	$16,551	$19,568
Federal Gross Debt (billions)	$265.2	$267.5	$258.9
Bond Volume, NYSE (millions)	$15.9	$17.1	$12.7
Stocks Sales, NYSE (thousands of shares)	9,552	8,537	6,356
Loans and Investments (billions)[4]	$77.8	$77.5	$73.6
United States Gov't. Obligations Held (billions)[4]	$31.3	$31.3	$31.9
PRICES			
STEEL's Weighted Finished Steel Price Index[6]	181.31	181.31	171.92
STEEL's Nonferrous Metal Price Index[6]	225.1	225.1	243.6
All Commodities[7]	110.2	109.9	112.5
All Commodities Other Than Farm and Foods[7]	113.4	113.3	114.2

*Dates on request. [2]Preliminary. [3]Weekly capacities, net tons: 1953, 2,254,450; 1952, 2,077,010. [4]Federal Reserve Board. [5]Member banks, Federal Reserve System. [6]1935-1939=100. [7]1936-1939=100. [8]Bureau of Labor Statistics Index, 1947-1949=100.

units, or 87 per cent more than the 371,689 sets obtained in January, 1952.

Suggesting that the industry may have a long way to go before it saturates the market for sets, the Federal Communications Commission announces that it has O.K.'d 313 grants since last May for construction of new TV sending stations.

Bank Clearings Jump . . .

As the nation's output reaches upward, dollars changing hands in leading industrial cities are moving at a furious pace. Bank clearings in 25 leading cities in the week ended Mar. 18 totaled $19.5 billion, about 0.6 per cent under the comparable week in 1952. Yet significant advances over last year were made in the heavily industrialized communities. Clearings that week increased over the year by 20.3 per cent in Detroit, 19 per cent in Baltimore, 14.4 per cent in Cincinnati and 13.4 per cent in Cleveland.

Electricity Output High . . .

Electricity production, a good indicator of industrial velocity, is standing high above output a year ago, despite mild weather in 1953. The Edison Electric Institute says that the weekly turnout of electricity in February loomed about 9.3 per cent over the comparable weeks in 1952. Further over-the-year advances may be in the cards this spring; power output in the week ended Mar. 14 totaled 8.1 billion killowatt-hours, or 9.8 per cent over the week ended Mar. 15, 1952.

Business Failures Increase . . .

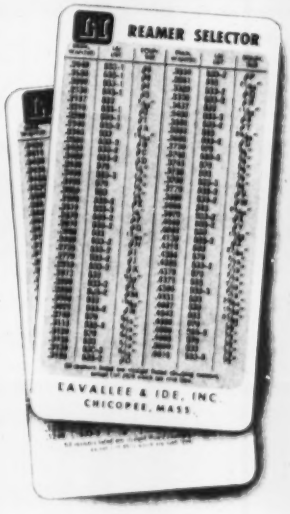
Casting a shadow on the otherwise bright industrial picture is the increase in business failures. Failures rose 7 per cent in February to 691 enterprises, the heaviest toll in ten months, reports Dun & Bradstreet Inc.

Liabilities involved in February's failures climbed 17 per cent over the month to $27.3 million, the largest volume since October.

Trends Fore and Aft . . .

Wholesale prices in the week ended Mar. 18, inched upward for the first time in many weeks as prices of both farm products and metals increased . . . The population of the U. S. increased 2.7 million to 158,657,000 persons in the year ended Feb. 1 . . . Railroads in the future will own 70-foot flatcars carrying truck-trailers to facilitate deliveries, predicts L. K. Sillcox, vice chairman of New York Air Brake Co. . . . Market production of natural gas in 1952 was 7 per cent greater than in 1951.

NOW L&I makes REAMER SELECTION EASY...



This sturdy pocket size Reamer Selector is a must for buyers and users of reamers. It lists 143 hole sizes from .0400 thru .5010 which can be reamed with STANDARD L&I Reamers. Includes catalog numbers and equivalent sizes for easy ordering.

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ANNOUNCING 4 NEW CUTTING OILS!

2 DUAL-PURPOSE OILS (lubrication and cutting)

SUNICUT 11-S for medium duty on automatic screw machines

SUNICUT 209-S for heavy duty on automatic screw machines

2 SINGLE-PURPOSE OILS (cutting only)

SUNICUT 102-S for heavy duty on automatic screw machines

SUNICUT 110-S for heavy duty service in broaching, threading, gear cutting, heading and similar applications

All four oils keep parts and tools cooler, help maintain closer work tolerances, permit longer runs between tool dressings. All are odorless and light in color. In addition, Sunicut 11-S and 209-S have high lubricating value and are nonstaining.

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INDUSTRIAL PRODUCTS DEPARTMENT

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Men of Industry

H. BRUCE RASMUSSEN
. . . Miller Motor sales manager

ALBERT B. DISS
. . . Watson-Stillman v. p.-gen. mgr.

MYRON S. CURTIS
. . . Warner & Swasey engineering v. p.

Miller Motor Co., Chicago, announces the following changes and additions to its sales staff: **H. Bruce Rasmussen** becomes sales manager in charge of its coast-to-coast sales organization. He formerly was with Baker Chemical Co. New factory salesmen include **Jack Frink** and **John Vaas** in the Chicago area; **Stephen Stiles** in the Detroit area; and **Roger Lawson** in the Cleveland-Akron-Youngstown area.

R. G. LeTourneau Inc., Peoria, Ill., appointed **John W. Schoen** vice president and general sales manager. Starting Apr. 15 he will direct the sales division as well as other related departments. He replaces **R. E. McCluskey,** resigned. Mr. Schoen had been vice president-sales with LaPlante Choate Co. When that company was acquired early this year by Allis-Chalmers Mfg. Co., Mr. Schoen resigned to become consultant for David Brown Industries.

Karl Goetz was made manager, San Francisco branch, **Kurt Orban Co.** He formerly was with Friden Calculating Machine Co. Inc.

Albert Steg becomes controller of **Borg-Warner Corp.**, Chicago. His resignation from his present position as controller of American Optical Co. becomes effective Mar. 31.

Albert B. Diss was appointed vice president and general manager, **Watson-Stillman Co.**, division of H. K. Porter Co. Inc., Roselle, N. J. In his new position Mr. Diss will be in charge of all manufacturing and sales operations. He was formerly vice president-manufacturing.

M. Merle Harrod was elected president of **Wapakoneta Machine Co.**, Wapakoneta, O. He succeeds the late **Carl D. Fischer Jr.** Mr. Harrod was formerly vice president. He has been with the firm 17 years.

M. MERLE HARROD
. . . president of Wapakoneta Machine Co.

Myron S. Curtis, for the last four and half years director of engineering of **Warner & Swasey Co.**, Cleveland, was elected engineering vice president.

American Steel & Wire Division, U. S. Steel Corp., appointed **Richard R. Snow** assistant to vice president-operations at Cleveland, and **John P. Debri** as general superintendent of its Joliet, Ill., plant. Mr. Debri succeeds Mr. Snow, who leaves his Joliet post to succeed **Burton H. Gedge,** retired.

W. F. Huntley was named superintendent of the blast furnace department, Aliquippa, Pa., Works, **Jones & Laughlin Steel Corp.** He succeeds **Elmer H. Riddle,** retired. **A. T. Sadler Jr.** succeeds Mr. Huntley as assistant superintendent. **Si Feigenbaum** was named works metallurgist, Pittsburgh Works Division, succeeding **S. C. Faddis,** transferred to the Cleveland Works Division as assistant works manager to succeed **J. M. McColloch,** retired. **K. S. Loofboro** was named superintendent of blast furnaces, coke works and dock at the Cleveland Works.

Dr. Grayson Kirk, president of Columbia University, was elected to the board of directors of **International Business Machines Corp.**, New York, filling a vacancy caused

by the death of **Augustine L. Humes**.

William F. Alexander becomes assistant manger, procurement department, **Koppers Co. Inc.**, Pittsburgh. Since 1948 he has been responsible for purchasing of materials for coke oven and steel plant construction projects of Koppers' engineering and construction division throughout the Western Hemisphere.

Emil Holzwart was elected vice president-production, **General Box Co.**, Des Plaines, Ill.

J. T. Tucker was appointed general manager in charge of oil equipment sales for **Emsco Derrick & Equipment Co.**, Los Angeles. He will handle responsibilities of **Paul Courtney** who resigned as vice president of the company.

At the switchgear division of **Westinghouse Electric Corp.**, Pittsburgh, **Maurice H. Hoggs** was appointed assistant manager, **Charles P. West** manager of engineering and **Charles E. Bickham** manager of order service.

At **Stamco Inc.**, New Bremen, O., **James R. Cummings** was made director of engineering and sales, and **William Bailey III** is now in sales and service. Before joining Stamco, Mr. Cummings was with Reynolds Metals Co. in Richmond, Va., and Tennessee Coal, Iron & Railroad Division, U. S. Steel Corp. Mr. Bailey joined Stamco in 1950.

MAX M. MULLER

HARVEY N. BARRETT JR.

. . . vice presidents of Basic Refractories Inc.

Basic Refractories Inc., Cleveland, elected two vice presidents: **Max M. Muller** will direct operations and engineering and **Harvey N. Barrett Jr.** will be in charge of sales activities.

Gerry T. Attridge, general manager, **Lovejoy Tool Co.**, Springfield, Vt., was elected vice president.

Richard A. Smith was elected to succeed his father, the late **Irving R. Smith**, as president of **Sterling Wheelbarrow Co.**, Milwaukee. The new president was formerly vice president of the firm. **Harold E. Smith**, brother of Irving, and president of T. L. Smith Co., was elected vice president of Sterling. **Martin A. Dooley**, cashier, was elected treasurer.

J. C. Woods was appointed division sales manager and **C. J. Stubble** division tubular manager of the eastern division of **National Supply Co.** Both have served as assistant managers of that division since 1950. Mr. Woods continues headquarters at Toledo, O., and in addition will handle sales activities in Chicago, St. Louis, Findlay, O., and Cleveland pending reallocation of those responsibilities. Mr. Stubble continues headquarters in Pittsburgh, where additional responsibilities include supervision of sales of well head equipment manufactured by the company's Houston plant.

E. A. Longenecker, formerly president of LeRoi Co., Milwaukee, and Lauson Co., New Holstein, Wis., and more recently associated with Jacobsen Mfg. Co. at Racine, Wis., was elected president of **Yard-Man Inc.**, Jackson Mich., manufacturer of hand and power lawn mowers.

Hiram Swank's Sons, Johnstown, Pa., appointed **B. A. Rhine** director of sales, **W. K. Sworb** assistant director of sales, and **C. Ferguson Swank** also an assistant of sales. Mr. Rhine succeeds **H. E. Townsend**, retired. Mr. Swank transfers from Cleveland to Johnstown.

After 47 years of service, **Judson H. Mansfield** has retired from **Greenlee Bros. & Co.**, Rockford, Ill. He is succeeded by **Joel A. Jan-**

JAMES R. CUMMINGS

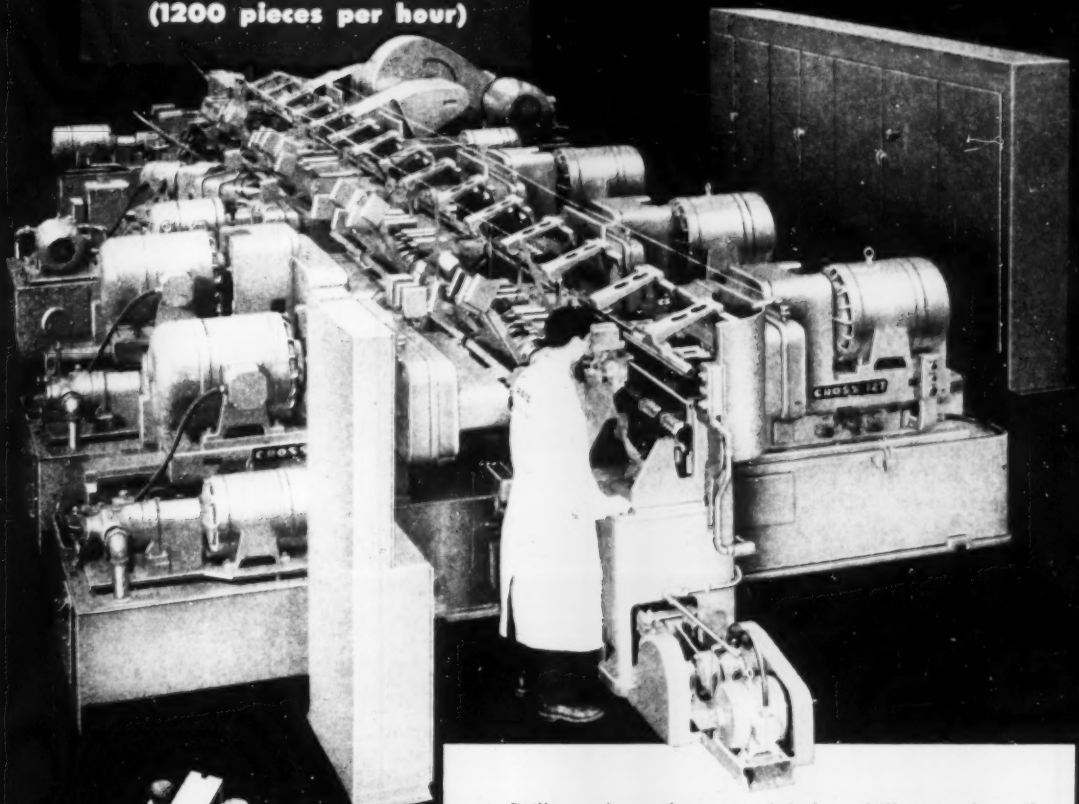
WILLIAM BAILEY III

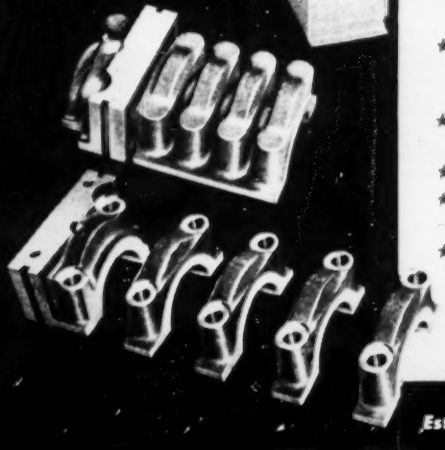
. . . new appointments at Stamco Inc.

Mills, Drills, Spotfaces and Taps Bearing Blocks

(1200 pieces per hour)

Another Transfer-matic by Cross





- ★ Drills and spotfaces stud holes; drills angular oil hole; drills and taps two screw holes; mills bearing lock slots; and saws into five individual pieces.
- ★ 240 bearing block sets (1200 pieces) per hour at 100% efficiency.
- ★ Capacity for machining two sets of parts at a time.
- ★ Two heavy-duty, 25 hp, vee belt drive, milling spindles for sawing operations.
- ★ Other features: Built-in chip conveyor, automatic lubrication, overhead transfer mechanism, gravity operated cam clamping for work holding fixtures, J.I.C. hydraulic and electrical construction.

Established 1898

THE CROSS CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS

nenga as chief engineer of all divisions. Mr. Mansfield is retained as an engineering consultant.

Woodward Iron Co., Woodward, Ala., elected **John E. Urquhart** president and a director of the company succeeding **B. C. Colcord**, resigned. Mr. Urquhart had been general superintendent of all operations at Woodward Iron until 1941 when he resigned. He became an organizer in 1946 of Mill & Textile Supply Inc. He disposed of his interest in that company in 1947 and has been retired since that time.

Metal Hydrides Inc., Beverly, Mass., elected **Dr. Peter P. Alexander** chairman of the board and **Louis W. Davis** president and general manager.

Dodge Steel Co., Philadelphia, promoted **Edward H. Berry** to foundry manager and chief metallurgist and **Henry J. Kelly** as chief engineer.

Farrell-Cheek Steel Co., Sandusky, O., appointed **R. E. Pheiffer** assistant secretary-treasurer and **J. M. Ritter** assistant sales manager.

Robert D. Briggs was placed in charge of sales and service in the Cincinnati territory for **C & D Batteries Inc.**

H. R. Ryan transfers to the Indiana Harbor Works, East Chicago, Ind., of **Youngstown Sheet & Tube Co.**, as superintendent of the new No. 2 open-hearth department. **Robert Frushour**, formerly with Edgar Thomson Works, U. S. Steel Corp., joins the company to succeed Mr. Ryan as superintendent, bessemer and open-hearth department, Campbell plant, Youngstown.

Francis J. Sehn, former Detroit district sales engineer for Clearing Machine Corp., was elected vice president-sales at **Sahlin Engineering Co.**, Birmingham, Mich.

JOHN A. DEITRICH
. . . new president, Hind Steel Co. Inc.

John A. Deitrich was elected president, **Hind Steel Co. Inc.**, Union, N. J. Formerly divisional general manager of Carpenter Steel Co., Mr. Deitrich is known as a pioneer metallurgist in welded stainless steel tube.

Christian F. Beukema of U. S. Steel Corp.'s raw materials division in Pittsburgh, was named general manager of operations, **Michigan Limestone Division**, Detroit.

Murray E. Rhue, director of manufacturing, **Morgan Engineering Co.**, Alliance, O., resigned as of Mar. 12, and is succeeded by **Harvey W. Bush**, recently general manager of Rack Engineering Co.

Roger E. Bremer was appointed director of purchasing, **Packard Motor Car Co.**, Detroit. He succeeds **Russell R. Rees**, a Packard executive for 38 years, now retiring. **Oliver E. Rodgers** was made chief engineer, jet engine division. Mr. Bremer joins Packard after serving as purchasing agent for Lincoln-Mercury.

AUGUST B. HOEFER
. . . new duties with Udylite Corp.

August B. Hoefer was elected vice president, **Udylite Corp.**, Detroit, and vice president and general manager of **Frederic B. Stevens Inc.**, subsidiary company. His headquarters will be in Detroit.

Warren T. Trask was named assistant manager, metal division, **National Lead Co.'s** St. Louis and southwestern branches. He continues manager of the steel package division.

Ralph E. Knowles, formerly works manager, armament division, **United States Electrical Tool Division**, Emerson Electric Mfg. Co., St. Louis, was appointed division manager at Cincinnati to succeed **Harry C. Levenson**, resigned.

Trailmobile Inc., Cincinnati, appointed **E. W. Barnekoff** director of purchases and **W. H. French** Cincinnati plant purchasing agent. **L. P. Haverkamp** was made general plant controller of the company, subsidiary of Pullman Inc.

Ohio Ferro-Alloys Corp. appointed

(*Please turn to Page* 118)

OBITUARIES...

Harold C. Osman, 61, vice president, **Crucible Steel Casting Co.**, Lansdowne, Pa., died Mar. 17.

Ernst Hediger, 51, general manager, Globar Division, **Carborundum Co.**, Niagara Falls, N. Y., died Mar. 19.

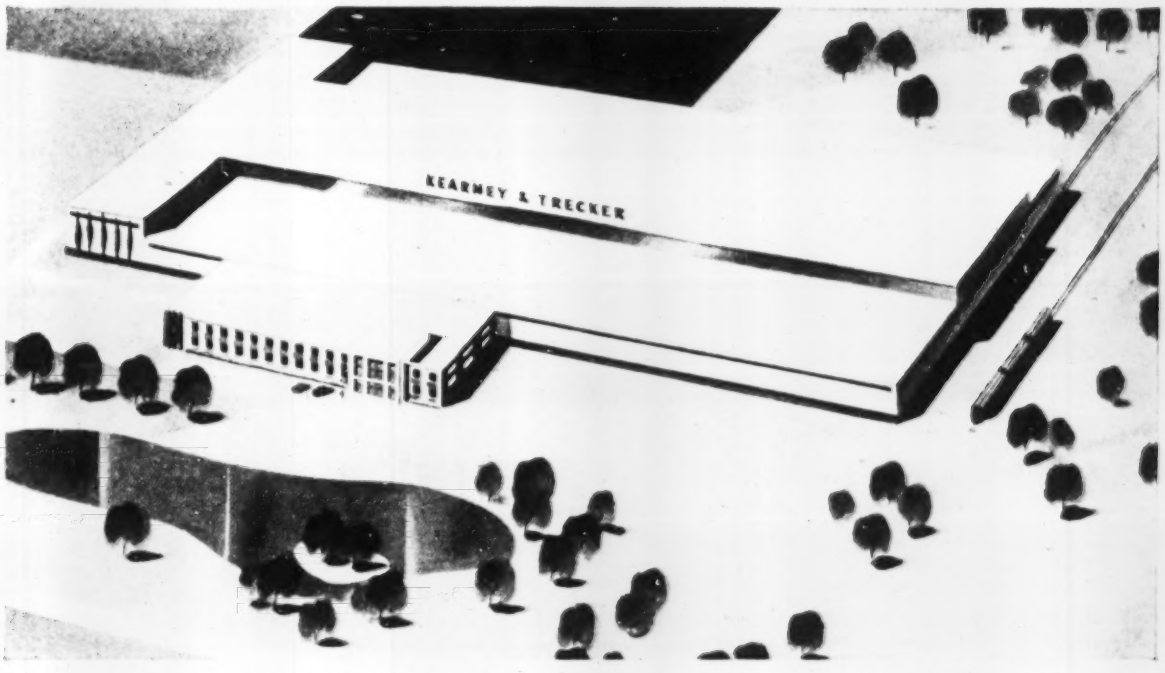
Walter W. Patnoe, 65, chief engineer, **Basic Refractories Inc.**, Cleveland, died Mar. 4.

Adolph Peters, general manager, **Wm. J. Hunt Mfg. Co.**, Baltimore, died Mar. 11.

Charles W. Engle, former superintendent and chief engineer, **Jones & Laughlin Steel Corp.** plant in Pittsburgh, died Mar. 19.

Charles R. Kuehn, 57, assistant treasurer, **United States Steel Export Co.**, New York, died Mar. 16.

Stephen Pesky, 54, president, **Empire Brass & Aluminum Foundry Inc.**, Milwaukee, died Mar. 19.



Here it is! Kearney & Trecker's new Special Machinery Division — nearly 200,000 sq. ft. of new plant with new tools and equipment. An experienced, fully-staffed team of sales, engineering and production experts is ready and waiting to serve you . . . by engineering new production methods.

INCUBATOR . . . for Production Ideas

This plant is being built for you . . . to engineer *new* production methods — to build the large or small special machines, tools and fixtures you need to improve production and cut costs.

Production behind schedule?

Costs going up, up and up?

Will special machines, special tools and fixtures or special arrangements of standard machines help you solve these problems?

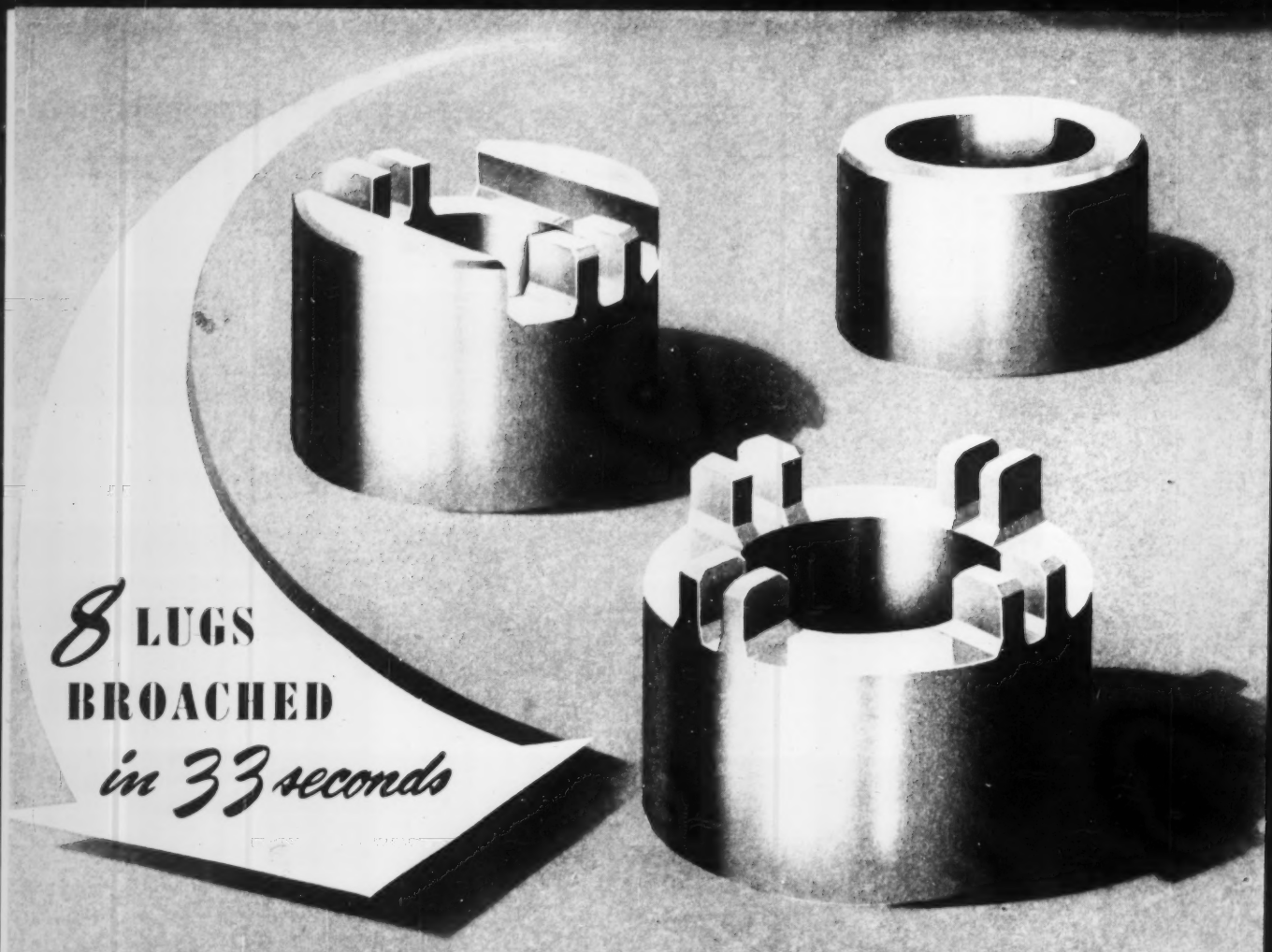
Then why not be among the first to take advantage of the 5-million-dollar-plus investment that Kearney & Trecker is making in new plant, new tools and new engineering to help you solve them.

Kearney & Trecker *is no newcomer* to the field of special machine tools and allied special equipment. During the past 50 years millions of dollars worth of Kearney & Trecker special machinery has been produced for plants all over the world. And that doesn't include the 60,000 standard Kearney & Trecker milling machines and other machine tools so well known and so widely accepted everywhere.

Kearney & Trecker is already working on new production ideas, new equipment and tool designs to be produced in this plant. Kearney & Trecker Special Engineering and Methods Analysts are ready right now to serve you with (1) Prompt response to your inquiry, (2) Immediate engineering help on your problem, plus, (3) The newest, finest and most complete facilities to build the special equipment you need — big or small.

Phone, write or wire The Special Machinery Division, Kearney & Trecker Corporation, Milwaukee 14, Wis., today. Get the facts about Kearney & Trecker's Special Machinery Division and how it can serve you.

KEARNEY & TRECKER
MILWAUKEE
MACHINE TOOLS



To produce eight single lugs on the end of a steel sleeve was a problem recently given to Detroit Broach.

After analysis of the operation, Detroit Broach recommended a single ram vertical surface broach to do the job. One of the problems within the job, in addition to increasing output, was the necessity of holding a close tolerance between the lugs.

The vertical broaching machine was set up with a two-station fixture which power-clamps the parts. A single pass of the broach forms four lugs across the sleeve. The sleeve is then indexed 90° and the other four lugs are formed. Complete cycle time—33 seconds per completed part. Slot tolerances are easily held and surface finish on the lugs requires no additional machining.

This is just typical of the specialized broaching techniques evolved by Detroit Broach for leading manufacturers. You, too, may have an application that can be materially reduced in time or cost by the economy of broaching or by review of present broach tooling. It will pay you to consult Detroit Broach for engineering or production data.

WORLD'S LARGEST MANUFACTURER OF BROACHES AND BROACHING TOOLS EXCLUSIVELY

DETROIT BROACH COMPANY

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Production AND Engineering NEWS AT A GLANCE

PICKLE LIQUORS GO—Most significant advance to come to the front in years in the treatment of waste pickle liquors is the term being applied by experts in the field to the new Ruthner process, developed in Europe and being handled in this country by Blaw-Knox. Waste liquors are treated with gaseous hydrochloric acid to precipitate ferrous chloride and regenerate pickle solution. Ferrous chloride is calcined to give back hydrochloric acid. Residual iron oxide can be sintered for blast furnace. Hard pressed for a cheaper disposal method, steel companies are taking a good look at the new process. A firm proposal is already in the works for one major installation.

MAGNESIUM'S GROWTH—Long range strength of the magnesium industry must depend on a stable foundation of civilian business. Although rearmament and war have been periods of greatest activity to date, they have driven many companies out of civilian development work since military uses left no excess metal available. During the current rearmament, fabricators are encouraged by the fact their supplies aren't cut off for civilian applications. A variety of civilian uses are already well established and others are either in the development or pilot plant stage. The pinch in thin sheet and extrusions is being corrected as new facilities are readied. These factors plus the estimate of a sizable increase in consumption forecast by the Paley report are encouraging. p. 82

LOW FREQUENCY HEAT—Heating a 7700-pound aluminum ingot to 750 F using a 60-cycle induction coil setup is nearly 15 times as fast as possible in a conventional furnace reports Aluminum Co. of America. Formerly soaking pits or other furnaces were used to bring ingots up to forging or extrusion temperatures. Time required was about 12 hours, compared with 50 minutes for the low frequency induction method. This development results from 10 years of research under Donald F. Bohn, chief electrical engineer. First work was with 9600 cycle coils with intermediate stops at 1000, 360 and 180 cycles. Each successive drop in frequency down to the present 60 cycles improved efficiency. The low frequency method's installation and operating costs compare favorably with conventional equipment.

BIG CUTS—Two factors share the credit for sizable reductions in machining time and elimination of much scrap in heavy metal removal. They are: Carbide cutters and tracer attachments. Although the reductions in machining time and operator skills required are enough to sell this technique to most companies there are other benefits that aren't so readily apparent. No longer is it necessary to stock hundreds of form tools as was necessary when using the plunge cut method of turning rolls on pianotype lathes. A general purpose tool room can handle the relatively few carbide tools needed. Downtime is reduced too. p. 84

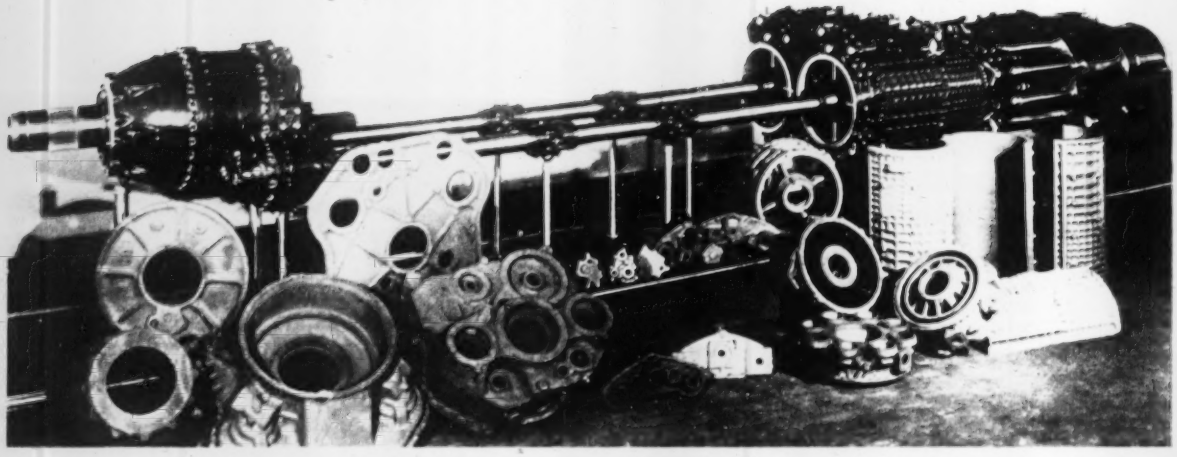
SERVICE PROOF—Simplification of television picture tube design by use of built-in magnetic focus device is announced by General Electric Co. Internal compensating focus lens eliminates need for manual focus yet gives better detail over wide range of operating voltages. External ion trap, focusing unit and mechanical support are replaced by a simplified ion trap and focusing unit both built within the tube and safe from adjustments by tinker happy service men or set owners. The magnet used in the ion trap is Carboloy Alnico 5 and is one tenth the size of the magnet previously used. Internal focusing uses three permanent magnets, measuring only $\frac{1}{2}$-inch in diameter and $\frac{5}{8}$-inch long.

LUBRICANT LIFE EXTENDED—Longer shelf and operating life of many greases and oils containing soaps as gelling agents are indicated by studies at the Navy's research laboratories. The various tests and investigations indicate a variety of silicone fluids and silicone-containing compounds are effective in preventing oxidation of synthetic diester greases at test temperatures of 200 F.

CHALLENGES GERMANIUM—A low cost material that may compete with germanium and silicon for use in transistors, rectifiers and other electronic devices is reported by Battelle researchers. A compound of aluminum and antimony it is one of several that may come from aluminum, gallium and indium with arsenic and antimony. Rectifiers have already been produced in the laboratory with the new semiconductor material and its use in making transistors is a distinct possibility, says the institute's Dr. Middleton. Electrical properties "at least as interesting as those of germanium and silicon" are reported and it may be superior to germanium and perhaps silicon for high temperature military operations. Cost is well below germanium.

DOWNTIME DEMON—Success in reaching out for the automatic factory will depend on ability to control costly downtime for expensive machine tools. Ralph E. Cross, executive vice president of Cross Co., Detroit, told members of the American Society of Tool Engineers at their Detroit meeting that downtime for changing tools is the real fly in the ointment. It's responsible for more than 75 per cent of all lost production time and is the only factor that has not been mechanized to any great extent. According to Mr. Cross, we will be able to maintain a complete line production at greater than 90 per cent efficiency by utilizing new devices which will eliminate downtime for tool changes. These devices will include the so-called automatic brain and the feed back principle.

Metalworking Outlook—p. 37 *Market Outlook—p. 145*



Magnesium sand castings reduce weight and provide added ruggedness in the Allison T-40 turbo-prop engine. Magnesium takes 570 pounds of 2500 total

Magnesium's Sights Set High

Currently the emphasis is on weight saving in military applications but long range growth depends on additional civilian uses. New facilities provide growth cushion

By A. W. WINSTON
Asst Manager, Magnesium Department
Dow Chemical Co.
Midland, Mich.

BORN of military necessity in the first World War and reaching the peak of its output to date in the second, magnesium holds considerable promise as a metal whose consumption will rise at a rate unmatched by other metals in the years to come. This is not the estimate of optimists within the industry but data contained in the Paley report. Consumption in 1975 is set at 384,000 tons compared with 55,000 tons consumed in 1952 and 44 tons in 1915 when the industry had its start.

Tremendous emphasis being placed today in the current defense program on military aircraft, airborne equipment, and air transportation is resulting in a much broader use of magnesium than experienced during the war, when castings made up the greatest use. Then the industry expanded a hundred fold over night and it was necessary to limit the usage of magnesium to applications proved and established in earlier development work. Fabrication facilities also were not available to produce sheet and extruded forms in significant quantities and applications were not developed to use these products.

Few Croppers—In general, the war experience with magnesium was excellent and the number of misapplications was surprisingly small, a tribute to the government services, the designers, contractors and fabricators, many of whom had no previous experience with magnesium. One fabricator, in producing aircraft control instruments, used, with outstanding success, approximately 13 million magnesium die castings.

Before the war there were about a half dozen foundries sand casting magnesium. By 1944 their number had increased to 60, doing a creditable job of producing aircraft landing wheels, engine parts, air frames and air accessory castings. The current defense program resulted in the reactivation of some of these wartime fabricating plants and some new sources were developed, totaling about 30 foundries and a dozen other fabricators.

Building for the Future—Real long-range strength of the magnesium industry must depend upon a stable foundation of civilian business. This is recognized by the government during the present rearmament program and considerable quantities of metal and fabricating facilities remain available to civilian industry. This encouraged fabricators who in 1950 were greatly concerned lest rearmament again drive many out of civilian development.

Growth curve predicted in the Paley report is, in the main, a growth of civilian uses and to attain it, a history of continued use development is necessary. In addition to the structural uses, potential large uses are being developed in other fields. These include expansion of the already well-known metal additions to nickel, zinc and aluminum alloys; the addition to gray iron to produce ductile cast iron; and chemical use in the production of titanium and several organic materials. A large field of rapid development is the cathodic protection of pipe lines, hot water heaters and ships. The use of magnesium in dry batteries is still in the pilot plant stage but this will be a major use in time because of the decreased weight and increased capacity obtainable. Magnesium sheet and other forms are finding use in the graphic arts field, in photoengraving processes involving direct printing from magnesium plates.

First International Magnesium Exposition sponsored by the Magnesium Association at the National Guard Armory in Washington, Mar. 31 through Apr. 2, 1953, will be the biggest event ever staged by the industry. Exhibits will include finished products and demonstrations of manufacturing processes.

Doing Well—Other structural applications include truck bodies and dock boards in the transportation and materials handling industries. The light weight of magnesium makes its use particularly attractive for portable tools and ladders and other articles which must be lifted and handled frequently. Die castings find limited use in aircraft instruments; much more in office machines. Process developments make their economic use in automobiles a distinct possibility, and many thousands are being assembled into cars every week.

Fabricating capacity for magnesium alloys is of great concern to those contemplating the use of magnesium in defense material. During the past two years the capacity for sand castings was greatly increased through the reactivation of wartime plants and the developments of several new sources. It appears that ample capacity is available at the present time for both defense and civilian needs. Facilities for die casting currently are fairly well filled but, as the amount of die castings required in the present program is not high, it is believed that ample capacity exists.

Easing the Squeeze—The greatest pinch during the last two years was in the availability of thin sheet and extrusions. To remedy this, one former magnesium rolling mill was reactivated and during the last few months a new rolling source developed specifically for plate and heavier gages of sheet. This enlarged capacity, combined with some changes in the aircraft production program improved the availability of sheet during the last few months.

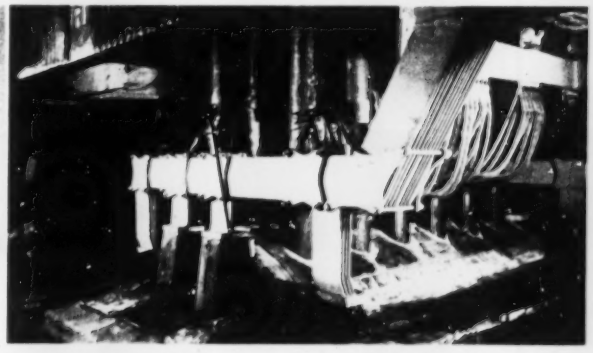
Development work going on for several years in the application of magnesium sheet would, in anything like an emergency, result in great sheet shortages. To provide for this contingency, a large rolling mill and extrusion plant is now being constructed in Madison, Ill. This plant, when developed to its full capacity operation within the next few years, will be able to provide several times the sheet production now available nationally. A large increase in the capacity for extrusions will also be provided. Mass production techniques will be applied in this project for the first time in the manufacturing of magnesium wrought products, and it is hoped that ultimately, production costs can be reduced to broaden the civilian applications of these structural magnesium forms.

Plenty Available — Increasing fabricating capacity must, of course, have an adequate supply of primary metal. At the moment, this is not a problem in magnesium. The rated capacity of all magnesium plants, understood to be operating at this time, is about 125,000 tons. Of this, the two electrolytic seawater plants account for 65,000 tons and can be considered to be economic. The other electrolytic plants and especially the three ferrosilicon process plants are stated to be non-economic. While it may be desirable to hold them in standby condition as a defense measure, the high cost of their output will prevent their use in developing a civilian magnesium industry.

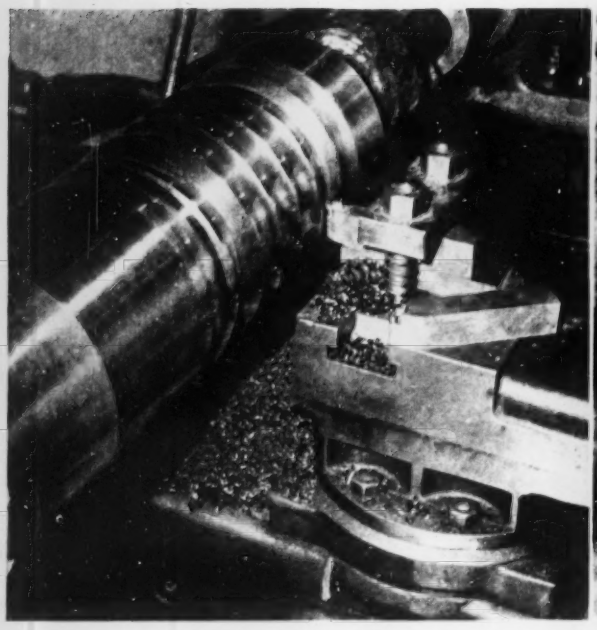
If we assume that demand for primary will develop about as indicated by the Paley report, it will catch up with the economic primary capacity somewhere between five and ten years from now. For the industry to grow beyond this point, new economic capacity must be developed. In view of the importance of magnesium to our national security, it seems apparent that the government should seriously consider the magnesium situation.

Of special interest in this day of declining ore reserves for many metals, is the unlimited availability of the raw material for magnesium. Not only are solid ores available cheaply and abundantly in many places throughout the United States, but magnesium is available in great quantities in the underground brines of Michigan and possibly other areas.

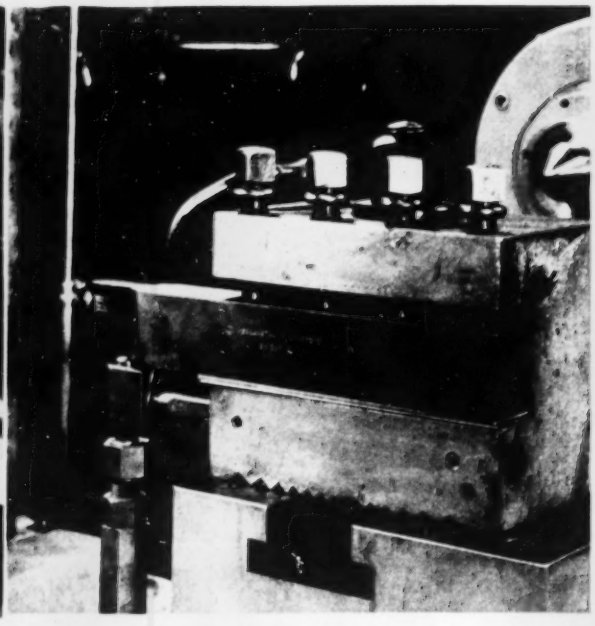
Typical of the automotive die casting applications are these steering gear shrouds. Other uses include housings, oil seal rings and a variety of decorative parts



Dow electrolytic cell for the production of magnesium from magnesium chloride. Raw material is no problem with available capacity exceeding the requirements



Indexable cylindrical carbide insert tool contours cast iron steel mill roll. Time was cut from 25 to 4½ hours



Carbide tool supported for deep contouring. Air-blast nozzle cuts high-temperature strains at the braze point

Contouring Takes on the Heavyweights

Joint development of improved contouring methods and carbide cutters opens another door. It's paying handsome dividends in the heavy metal removal field

By PATRICK H. GRIBBIN
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Latrobe, Pa.

ALTHOUGH contouring equipment is new to the heavy metal removal field it has been used during the last 25 years for simplified contouring of shafts.

Contouring used to be done by locating a drawbar on the back of the machine which generated tool carriage travel into the required contours or designs being machined into the workpiece. Before tracer attachments hydraulic, pneumatic, electronic and mechanical were added to machines it was general practice to rough out a workpiece skillfully by operating both the longitudinal and cross-feeds manually.

Took Skill—This practice was used on engine lathes and saved time for the operator who was required to finish at slower speeds in blending radii and angles to specifications of the desired contour. If the roughing-out process was not skillfully performed, many times the result was a scrap workpiece before the desired finish could be obtained.

Contouring is now an accepted practice. Many hidden savings realized through use of contouring together with impressive machining-time reductions are based on proved performance in the heavy machining field. Here are some savings you can realize in your shop with carbide contouring.

Less Skill Required—In the past operators had to have "know how" to rough and finish manually. This required a greater number of machine hours due to the necessity of plunging and blending the various shapes that were designed into the workpiece.

With modern tracer devices a class C machinist can be employed because of less skill required due to the job's over-all specifications being controlled by the guiding template. This only requires the operator supplying correct feeds and speeds to machine the workpiece's specific hardness.

Less Machine Time—Alloy steel rolls (495 Brinell) with an 11-inch diameter are contoured. Rough turning the excess stock on the roll's diameter is performed at 22 rpm with 0.031-inch per revolution conventional longitudinal feed using a mechanically held Kennametal K6 cutting tool. Roughing of the contoured shapes into the roll is also at 22 rpm with the

tracer attachment operating at feeds of 0.187 to 0.375 transverse and 0.375 to 0.750 longitudinal inch per minute.

Contour of this workpiece is finished at 17 rpm with the tracer attachment operating at feeds of 0.093 and 0.187 transverse and 0.187 to 0.375 longitudinal inch per minute all feeds controlled by a rheostat. Tool used for both roughing and finishing is a standard brazed style C which can easily be modified for many included angles and radii. This job consumed 35 to 40 hours using the "plunge-cut and blend method". Using the contouring method it was completed in only 8 hours.

Uniformity — Ability of tracer controls to duplicate with an exactness offers a precise method of checking alignment and guarantees ease of assembly. Also, as the operation is machine controlled and the human element minimized, scrap is virtually eliminated.

Performance regardless of machine is based on cutting tool's ability to operate at feeds and speeds necessary for long tool life with attendant high production. Tremendous savings are realized with long-life standard carbide tools able to machine workpieces of hardnesses heretofore unmachinable.

Tooling Simplified—Formerly it was necessary to stock hundreds of form tools when using the plunge cut method of turning rolls on piano-type lathes. However, with contouring practices many tools are replaced with a few standard carbide tools. Tracer attachment permits a general purpose tool room to handle the relatively few carbide tools needed for contouring and at no added overhead expense.

Index Tips—Much is to be gained by application of indexable carbide cutting tools. Outstanding savings are possible when using indexable tips with tracer or contouring attachments. Here again we should mention the hidden savings realized. Some of these are: Lessened down-time, reduced tool maintenance, easy regrind control of accurate tool shapes, in addition to carbide's ability for taking advantage of present day machine tools' fullest capacity by use of optimum feeds and speeds.

Contouring with indexable carbides has also proved large radii are practical on single point tools particularly for use with old machining equipment. Where a standard form is desired the indexable multiple cutting edges of carbide tips or inserts have numerous satisfactory applications.

Multiple-tooled carbide application machining forged steel freight car wheels. Contouring tools at lower right machine back rim, flange and fillet

Feed Changes—An example is contour or tracer turning and facing rough forged wheels at 180 sfm at 0.031-inch feed per revolution. All wheels are in a Brinell hardness range of 302 minimum to 341 maximum. Stylus of the contouring attachment located on the side head guides the carbide tool along the contour that is being machined.

Screw feeding mechanism effects four changes 0.007 to 0.013 to 0.031 to 0.041-inch per revolution. This again shows capabilities inherent in indexable mechanically-held round carbide inserts. Removal of 3/16-inch stock on the side is completed in one cut with the exception of the hub where $\frac{1}{2}$-inch of stock is machined quite easily due to its lower Brinell hardness of 265.

Longevity—Tool life is as follows: Facing operation uses a $1\frac{1}{4}$-inch diameter by $2\frac{1}{2}$-inch round carbide insert which gives six indexes and a production of 65 wheels per index. Length of insert affords ample stock for exceptionally long regrind-life.

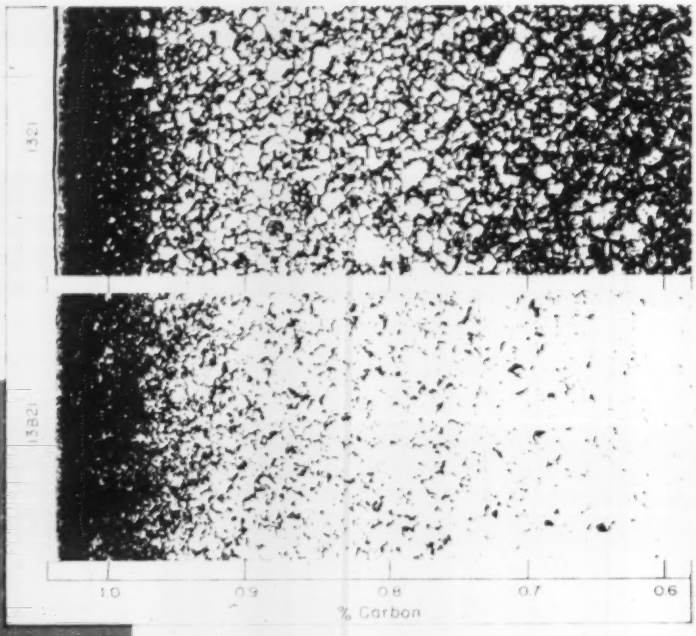
For contouring the flange and cutting the tread, this type of carbide insert gives five indexes at a production of 10 wheels per index using $1\frac{1}{4}$-inch diameter by $2\frac{1}{2}$-inch round carbide inserts.

Highway for Heavyweights—Same carbide-tooled applications may be used for machining single wear, multiple untreated and multiple treated wheels. Number of pieces machined per index will vary due to the particular type and hardness of the wheels being processed.

Tracer turning as described above, on shafts, small rolls and car wheels has paved the way for the heavy-duty equipment which is now being used for contour machining 60-inch diameter steel mill rolls weighing 35 tons.

Carbides, by giving operators a five-to-one reduction in machining time, plus a uniformity of finish and adherence to specifications, have been directly responsible for the rapid development of new contouring attachments.

Present trend of tracer equipment manufacturers is to prove their attachments can be applied to existing machinery. Next development will be devices for handling workpieces in such a manner as to assure continuous contour machining eliminating costly production downtime.



Microstructure in the carburized case of 1321 (top) and 13B21 (bottom) at 1 inch from quenched end of the hardenability specimen. Picral etch. 200X

New, Old Metals SHARE ADVANCES

Titanium and zirconium, as metals of the future, vie with steel at ASM sessions of Western Metal Congress. Metallurgists report improved techniques along the entire front

GLAMOUR METALS vied with the more conventional ones for top interest in the ASM technical program at the Western Metal Congress, held at Los Angeles, March 23-27.

Highlights on the glamour side were symposia on titanium and zirconium. The vast interest in the zirconium field was exemplified by presentation of 21 papers unprecedented so far as this metal is concerned. Little-known until recently this wonder metal is destined to play an important role in atomic power plants because of its corrosion resistance and favorable neutron properties. This accounts in a large part for the tremendous effort going into its metallurgical development.

Molybdenum and new nonferrous alloys came in for their share of the limelight. Not to be overlooked was the valuable data given on the case hardenability of boron steel.

Boron and Hardenability — At different carbon levels, hardenability varies in the carburized case of a boron-free steel because of the effect of carbon upon hardenability.

It varies to a greater extent in a carburized boron steel because of the combined direct effect of carbon upon hardenability, and the indirect influence of carbon in affecting the hardenability contributed by boron.

In work conducted at U.S. Steel Corp. laboratories by R. A. Grange and J. B. Mitchell, the effect of carbon and boron upon the hardenability of carburized steel was measured by examining the microstructure at selected carbon levels throughout the case and in the core of case hardened, end quenched hardenability specimens of a matched pair of 2 per cent manganese steels, one with and one without boron.

Results of this study reported at the ASM technical session showed that in the plain carbon steel, hardenability increased as carbon increased to 0.8 per cent and then decreased with higher carbon. An important point: The quantitative hardenability effect of carbon was greater the larger the percentage of martensite selected as the criterion of hardenability.

Select a Standard—The U. S. Steel researchers pointed out that the pattern of hardenability variation through a carburized case of either a plain or a boron steel, especially the latter, depends to some extent upon the hardenability criterion. In the past it has been common practice to use 50 per cent martensite as the criterion of hard-

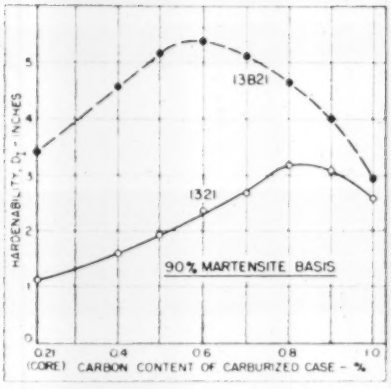


Fig. 1—Variation in hardenability throughout case of carburized 1321 and 13B21 steel

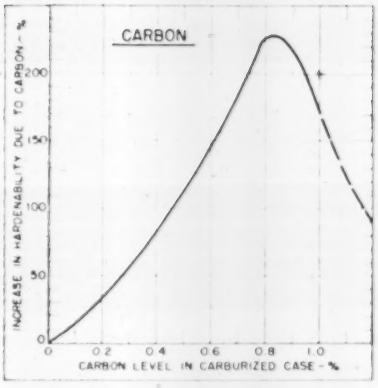


Fig. 2 — Hardenability effect of carbon in carburized steel. 90 per cent martensite basis

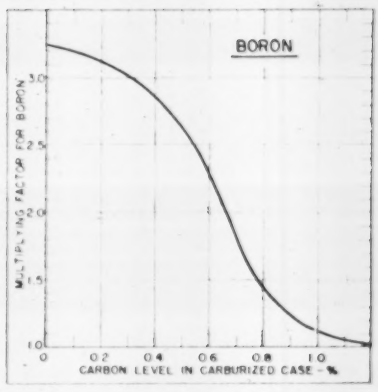


Fig. 3 — Hardenability effect of boron in carburized steel. 90 per cent martensite basis

enability because measurements are easier to make on this basis. However, a hardened steel containing only 50 per cent martensite is not satisfactory for many applications.

The use of 50 per cent martensite as the hardenability criterion is justified only if carbon and the alloying elements can be shown to have essentially the same hardenability effect on a 50 per cent basis as when a higher percentage of martensite serves as the criterion. This was not true in carburized 1321 and 13B21, which were used in this study. Presumably, it will not be true in other carburized steels.

Not Necessarily 100 Per Cent—Commercial experience has shown that even in highly stressed parts, a hardened structure need not contain 100 per cent martensite; 80 to 90 per cent martensite is adequate. Recognizing the desirability of choosing a definite percentage of martensite as the criterion of hardenability in order to facilitate subsequent comparisons, experimenters Grange and Mitchell selected 90 per cent martensite as criterion for their tests.

The curve in Fig. 1, shows values for each steel used in the tests on the basis of 90 per cent martensite plotted as a function of the carbon level in the carburized case. These curves show that although the boron steel has relatively much greater core hardenability, its hardenability is only slightly greater in the outer case.

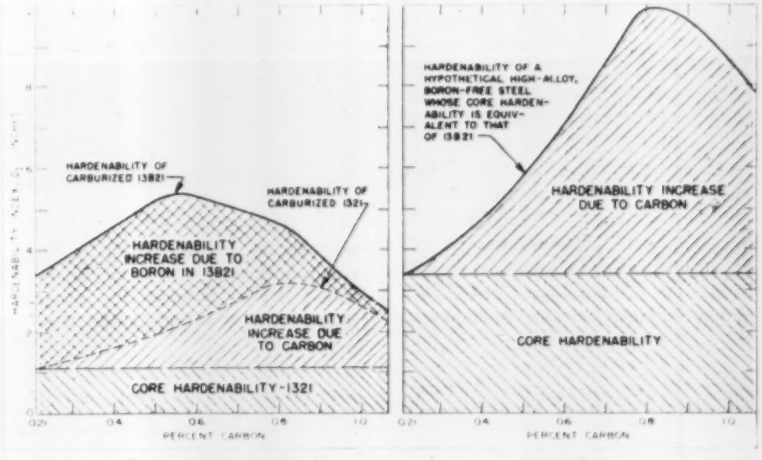
At 1.0 per cent carbon, the hardenability of the boron steel is lower than in its core; whereas case hardenability of the plain steel at this carbon level is much higher than in the core. The trend at high carbon levels suggests that hardenability would continue to decrease at carbon levels above 1.0 per cent.

This demonstrates the disadvantages from the standpoint of hardenability in carburizing to very high carbon levels, especially when using a boron steel. The curve for carburized 1321 attains maximum hardenability at 0.8 per cent carbon as compared to a maximum at 0.6 per cent carbon in boron steel.

Assuming these data for carburized 1321 and 13B21 are reasonably representative of other carburized grades, it is obviously not possible to match a boron steel and plain steel with respect to hardenability throughout both base and core. For the same core hardenability, case hardenability is sacrificed when a boron steel is used.

How to Estimate—Data obtained in the investigation gave the quantitative effect of carbon and boron on hardenability of these 2 per cent manganese steels and may be used to calculate the approximate hardenability of other steels. Fig. 2 indicates quantitatively the increase in hardenability as carbon increases and Fig. 3 shows the hardenability factor for boron as a fuction of carbon content.

In the method of estimation proposed by the investigators the core hardenability is multipled by a fac-


HARDENABILITY OF CARBURIZED 13B21
HARDENABILITY OF CARBURIZED 1321
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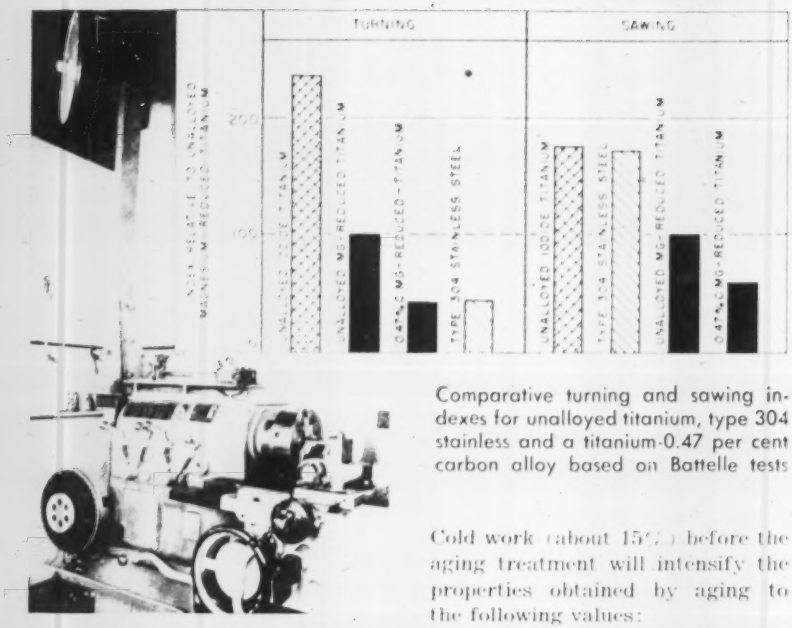
HARDENABILITY INCREASE DUE TO CARBON
CORE HARDENABILITY-1321
PERCENT CARBON
HARDENABILITY OF A HYPOTHETICAL HIGH-ALLOY, BORON-FREE STEEL WHOSE CORE HARDENABILITY IS EQUIVALENT TO THAT OF 13B21
HARDENABILITY INCREASE DUE TO CARBON
CORE HARDENABILITY
PERCENT CARBON

Fig. 4—Estimation of case hardenability. (Left)—Carburized 1321 and 13B21; (right) a hypothetical high-alloy boron-free steel whose core hardenability is equivalent to the core hardenability of 13B21 containing boron



Comparative turning and sawing indexes for unalloyed titanium, type 304 stainless and a titanium-0.47 per cent carbon alloy based on Battelle tests

Equipment for testing machinability of titanium. This type machine was also used in the development of a superior bessemer free-cutting steel

tor for carbon, and if a boron steel, by a factor for boron at each of a series of carbon levels in a carburized case.

This method applied to a high alloy, boron-free steel with a core hardenability equivalent to a 13B21 steel indicates that such a steel would have much greater case hardenability than carburized 13B21. In fact, it does not seem possible to match a boron steel with a higher alloy steel in respect to both case and core hardenability. If the core hardenabilities are equivalent, the case hardenability will be lower in the boron steels.

New Copper Alloy—Research at Battelle Memorial Institute has resulted in a new age-hardenable copper base alloy containing about 10 per cent nickel, 1.5 per cent silicon, and 4.0 per cent aluminum. According to the report given by D. B. Roach, R. B. Fisher, and J. H. Jackson the alloy can be readily formed in the solution treated condition and can be age hardened to the following properties:

Yield strength	120,000 psi
Tensile strength	140,000 psi
Elongation	8 per cent
Proportional limit	85,000 psi
Modulus of elasticity	19 million psi
Electrical conductivity	11% of copper

Cold work (about 15%) before the aging treatment will intensify the properties obtained by aging to the following values:

Yield strength	129,000 psi
Tensile strength	143,000 psi
Elongation	5 %
Proportional limit	104,000 psi
Modulus of elasticity	19 million psi

This alloy appears to be a possible replacement for applications where the extremely high tensile strength of copper-beryllium alloys is not required. The alloy is being considered for the production of spring contacts to be utilized in various types of business machines.

Improved Heat Treating Pots—Other work was carried out at Battelle to improve the corrosion resistance of heat treating salt containers. Results reported by J. H. Jackson and M. H. LaChance indicated possibility of service life improvement of the order of one and a half to five times normal pot life.

The resistance of a 15 chromium-35 nickel and a 12 chromium-60 nickel container to corrosive attack and particularly intergranular attack can be increased by reducing carbon content to about 0.08 per cent. Normally the carbon content is around 0.45 to 0.50 per cent.

It was reported that an alloy of 17 per cent chromium containing little or no nickel will perform as well as or better than some of the higher alloys in all the chloride-type baths if they do not contain sizable quantities of carbonate.

Zirconium

Although of relatively recent major interest, zirconium is the subject of intensive research as exemplified by some 21 papers presented at the ASM zirconium symposium.

Researchers at Horizons Inc., reported on work involving a survey of some 80 salt bath systems to determine a suitable electrolytic bath for the production of zirconium.

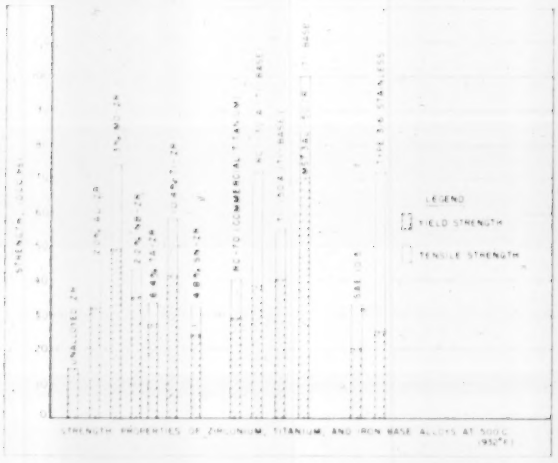
A fused salt bath containing 25 to 35 per cent of potassium zirconium fluoride (K_2ZrF_6) in sodium chloride (NaCl) looks good for zirconium production. High current densities and temperatures of the order of 1561 to 1650 F give optimum results, producing coarsely granular zirconium powder, easily recoverable by a simple washing technique.

Special Precautions — The production of ductile crystalline zirconium metal was achieved through use of an inert atmosphere carbon resistance furnace. High purity starting materials and an oxygen-free atmosphere are important in obtaining a high purity product through fused salt electrolysis.

Special electrolytic cells, heated by carbon resistors and operating in an inert atmosphere of argon were used. This work, which was conducted under contract with the Atomic Energy Commission, points toward a practical electrolytic method for producing high purity zirconium. A significant aspect is that the new process employs readily available materials and uses only modified forms of standard equipment.

At present time zirconium metal is produced by the Kroll process, which uses magnesium for reduction to sponge, or by the iodide method. It is melted in either a graphite or water cooled copper crucible in a vacuum or inert atmosphere.

Fabrication Grows Up — R. B. Gordon and W. J. Hurford, Westinghouse Atomic Power Division, reviewed the development of zirconium fabrication technology from laboratory work on 2-pound ingots in 1949 to present conversion practices for 500-pound ingots. Zirconium can be readily fabricated despite the fact that its properties and characteristics are somewhat



Comparative strength properties of zirconium, titanium and iron base alloys at temperature of 932 F (500 C)

Experimental furnace for melting molybdenum. Micrograph shows longitudinal section of unalloyed molybdenum 250X

different from those of most other common metals.

Once these differences are understood, the metal can be worked into practically any shape or form, in many cases with equipment and processes used for other metals. Arc cast zirconium ingots are currently made in diameters from 4 to 12 inches with weights up to 500 pounds. Prior to fabrication, ingots are rough machined to a diameter where their surface is relatively free from defects.

How To Forge—Four-inch diameter ingots are heated for not more than one hour at 1800 F while ingots as large as 10 inches in diameter are soaked for only two hours prior to forging. Although these times are shorter than those used for most metals, zirconium works very easily after such a short heating time and does not crack during forging and rolling. Arc cast ingots are completely free from the center burst difficulties found in round ingots of other metals that are made by conventional casting practice.

Zirconium alloy ingots up to 10-inch diameter have been pressed on a 500-ton forging press; however, several reheats were necessary to work the material to 2½-inch thick 8-inch wide slabs. With a 1000-ton press, 12-inch diameter ingots have been easily pressed into the same size slabs without reheating. A 6000-pound air operated forge hammer will also work the 12-inch diameter ingots.

Strip Fabrication — Billets or slabs are conditioned for rolling into strip or sheet by sandblasting, etching in a nitric-hydrofluoric acid mixture and grinding the surface to remove local defects. Slabs 2½-inches thick are heated for 40 to 60 minutes in either gas or electric furnaces and then rolled. Rolling can be done in any conventional rolling mill. However, it should be capable of reducing the slabs to strip wthout reheating so that contamination of the strip is minimized.

Machines Like Aluminum — Iodide and sponge zirconium with carbon contents of less than 0.1 per cent, as normally produced by arc melting, are readily machined by all standard operations such as turning, drilling, tapping, boring, slab milling, face milling, sawing and grinding. The general machining characteristics of zirconium are similar to those of aluminum except for the greater abrasiveness of zirconium which results in somewhat greater tool wear.

Experimental fabrication of zirconium has been done by the following companies: Allegheny-Ludlum Steel Corp., Babcock & Wilcox Tube Co., Bridgeport Brass Co., Carpenter Steel Co., Firth Sterling Inc., Heppenstall Co., Olin Industries Inc., Superior Tube Co., and Universal-Cyclops Steel Corp.

Oxygen Helps Strength — Strength of zirconium at elevated temperatures is improved by addition of oxygen, according to R. M. Treco, Bridgeport Brass Co., who reported on zirconium-oxygen alloys at the symposium.

Experiments showed that the strength properties of pure crystal bar zirconium are enhanced by the addition of small amounts of oxygen with resistivity and ductility only slightly impaired, while larger amounts give brittleness. The zirconium-oxygen alloys had good working properties and were comparable to pure zirconium in this respect.

Titanium

At the opening session of the titanium symposium, F. D. Rosi and F. C. Perkins, Sylvania Electric Products, presented data on strain aging effects. The tensile properties of titanium of commercial purity were investigated in the temperature range 196 C to 652 C at constant strain rates of 0.003 min^{-1} and 0.138 min^{-1}. The results of these tests showed that titanium exhibits the usual mechanical effects that are associated with the strain aging phenomenon.

Not Unexpected — The experimenters pointed out that this is not surprising since titanium contains as impurities small amounts of nitrogen and carbon, which are

generally associated with appearance of these effects. The maximum yield point effect appeared to occur around 232 C. Discontinuous yielding or serration in the stress-strain curves was observed in a higher temperature range.

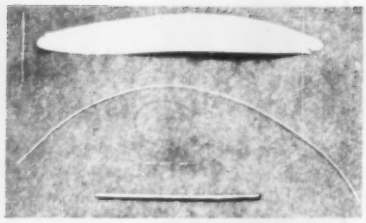
Aging at 200 C (392 F) resulted in both the appearance of a yield-point and a strengthening in the room temperature curve of a specimen which had been given a prestrain of approximately 5 per cent.

Machining Titanium — Battelle Memorial Institute researchers reported on work sponsored by Kennecott Copper Corp. to study the machinability of titanium. Turning tests and saw tests were used for the evaluation.

The equipment used in the machining tests was developed at Battelle and among other things was instrumental in previous work on the development of a superior bessemer free cutting steel. It consists basically of a lathe with the tool carriage disconnected from the fixed feed mechanism and mounted on ball bearings. The test machine also provides a means for applying a predetermined lateral tool pressure and a device for recording the number of spindle revolutions occurring during a certain length of tool travel.

Boron and Arsenic Help—Titanium was found to be sensitive to the conditions of testing, particularly tool thrust. In the turning test, various combinations of tool thrust and surface speed of turning were investigated. High purity titanium made by the iodide method was much more machinable than commercial magnesium-reduced titanium. For alloys made with commercial magnesium-reduced titanium, improvements of up to 40 per cent in turning ratings were noted with low concentrations of boron and arsenic, while improvements of up to 10 per cent in saw-test ratings were obtained with low selenium concentrations. Carbon additions were detrimental to machinability.

The Battelle tests showed a good correlation between machinability and strength level. Machinability tends to decrease with increasing strength level. When the strength level is maintained constant, insoluble phases improve machinability. Alloying additions studied were boron, carbon, beryllium, silicon, sulphur, selenium, phosphorus, tellurium, germanium, and arsenic.



Fabricated zirconium prepared from electrolytic powder. (Top) Sheet cold-rolled 96 per cent, 0.008-inch thick; (center) cold rolled and drawn wire; (bottom) ¼-inch cold rolled rod

Cold Properties — Investigations have been carried out at Ohio State University to determine the low temperature mechanical properties of two recently developed commercial titanium alloys, RC-130-B and Ti-150-A. The behavior of titanium at low temperatures must be known for efficient design of aircraft structures.

Fatigue, tensile and dilatometry tests were run over the temperature range from 77 F to −321 F. The endurance limits of both alloys were raised at low temperatures; RC-130-B showed the greater increase percentage-wise. Ti-150-A suffers a greater loss in fatigue strength as a result of notching than RC-130-B, but Ti-150-A has a substantially higher fatigue strength at all test temperatures.

Ti-150-A had slightly higher yield and ultimate strengths than RC-130-B except at very low temperatures. Elastic moduli of both materials increased at low temperatures, the increase being greater in Ti-150-A.

Titanium and Oxygen — A report was given on work carried out at the Armour Research Foundation to study the titanium-oxygen system. Titanium oxidizes rapidly above 1200 F, and in such operations as the production of sponge, melting, forging, and heat treatment oxygen must be considered as a possible source of contamination. The Armour workers found that the solubility limit of oxygen in alpha titanium is approximately 14.5 per cent oxygen from 1470 to 3090 F. A marked increase in hardness was obtained with the addition of oxygen to titanium.

Molybdenum

The results of studies at Battelle Memorial Institute to improve the high temperature properties of molybdenum by alloying were given before the ASM research session in a paper by W. L. Bruckart, M. H. LaChance, C. M. Craighead, and R. I. Jaffee. Eighteen different molybdenum base alloys were prepared by hydrogen sintering so that an evaluation could be made of their probable usefulness and service behavior at temperatures below the recrystallization range.

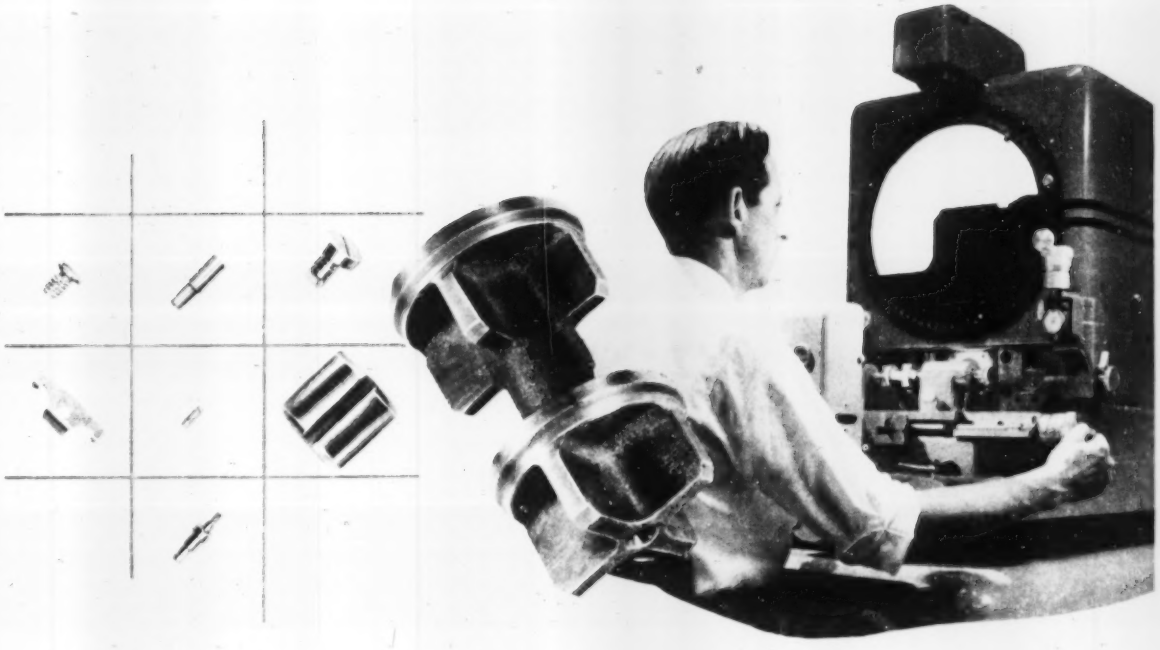
Potency of alloying, that is, the ability of small amounts of alloying addition to strengthen molybdenum was shown by the experiments to be in the order: Silicon, cobalt, iron, aluminum, chromium, and tungsten for the six most effective additions. This order of potency holds for Vickers hardness up to about 1500 F, which is below the recrystallization range.

Most Effective — However, for service the merit of an alloy is measured by the magnitude of its properties, not by the economy of alloying. On this basis, tungsten, which may be alloyed in large concentrations, is the most effective alloying addition for molybdenum, despite its small unit strengthening response. Considering the over-all strength of alloys possessing adequate ductility, the most effective alloying additions are: 1. 40 per cent tungsten, 2. 0.4 cobalt, 3. 30 tungsten, 4. 0.3 cobalt, 5. 0.25 cobalt, 6. 0.25 iron, 7. 0.4 iron, 8. 1 chromium, 9. 20 tungsten, 10. 0.25 silicon.

On the other hand, if the alloys that are hard to fabricate and are erratic in their fabrication behavior are eliminated, the most effective alloying additions are: 1. 0.25 per cent cobalt, 2. 0.25 iron, 3. 1 chromium, 4. 20 tungsten, 5. 0.25 silicon, and 6. 1 aluminum.

Engineering Educators Meet

Evaluation of the job engineering colleges perform will be the broad theme considered by American Society for Engineering Education at its annual meeting June 22-26. This year's convention goes to University of Florida, Gainesville, Fla., with about 100 conferences scheduled.



These parts help give Weston instruments their accuracy... they're checked on Kodak Contour Projectors

There is such a great variety of Weston instruments to measure all sorts of variables in all sorts of ranges that production on most individual items is small.

This creates a parts inspection problem. Precision requirements in many cases are so stringent that any measurable deviation from specifications is too big. Setting up toolroom instruments takes too long for the small volume of work being checked at any one time. Mechanical gages are even less economical at the low volume levels, and they just did not give the required accuracy on such jobs as checking the shoulder angles, concentricities, and specifications of the double-acting valve body shown above. (It goes in a recording thermometer and Weston makes it in many different sizes.)

Now Weston has converted to Kodak Contour Projectors. An inspector merely picks up the specification sheet covering a given part, gets the chart gage indicated there, puts it on the screen of the projector, and proceeds to sample according to specifications. Often, as with the valve body, gage blocks are used to step off the traverse of the projector work table. The inspector notes whether a shadow image coincides with a chart line after the table has carried it by the specified distance.

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Don't Write Off the Blast Furnace

Use of oxygen-enriched blast to correct a hanging furnace is open to question. Introduction of carbon monoxide with blast detrimental to furnace operation and economy

Part III

By CHARLES E. AGNEW
Consultant
Blast Furnace and Sintering Plant Operations
Cleveland

BELIEF expressed in the specifications that the use of oxygen in the blast contributes to a furnace hanging or bridging is of interest when compared to a contrary belief expressed in United States patent No. 2,051,383. This patent was issued Aug. 18, 1936, to Wilhelm Lennings and Ernst Karwat of Germany, and claimed that the use of oxygen in the blast can be used to correct hanging or bridging. Claims granted in the patent read:

1. "Method of overcoming the difficulties associated with the tendency of blast furnace charges to hang, which comprises increasing the oxygen content of the blast until the disturbance has been corrected.

2. "In a blast furnace smelting process, the method of correcting a hanging of the charge, which comprises increasing the oxygen content of the blast, and decreasing the temperature of the blast, until the effects of the disturbance have been eliminated."

Premises Are Conflicting — The conflicting conceptions of the two patents are of interest because of the indicated confusion of thought regarding effects from use of oxygen-enriched blast. Reasonable analysis of the Totzek furnace condition indicates hanging was caused from overloading the furnace with excessive stock travel. In principle, means suggested in the Lennings-Karwat patent for correcting a hanging furnace is virtually the same as commonly practiced with natural air blowing, namely, "pull heat" until the furnace "moves", or can be moved with a check of the blast. A temporary increase in the oxygen content of the blast would increase the coke combustion rate and consequently create a void into which the stock column could settle. Although reasonably correct in conception it is also reasonable to say that practical value of the claims in the Lennings-Karwat patent are open to question.

The Totzek patent specifications further state:

"As has already been mentioned a common blast furnace designed for the use of normal air as blast tends to freeze up when oxygen content of the blast is increased considerably. *This phenomenon is more surprising as on increasing the oxygen content much higher temperatures in the tuyere zone of the hearth will be found on observation through the tuyeres than in the normal blast furnace operated with air.* However, it has been overlooked that these higher temperatures occur only in a very limited area near the tuyeres and at the same time in a comparatively short distance from the tuyeres the temperature drops to a point considerably below the fusion point of the slag. Therefore, there is no continuous fusion and oxidation zone being formed in the hearth; but on considerably increasing the oxygen content there occurs between the tuyeres of the blast furnace of the usual design the formation of zones in which the slag freezes up and these zones extend into the bosh of the furnace. Because of these pillar-like walls the charge in the bosh is prevented from sliding downward. This is the reason for the occurrence which in earlier tests was spoken of as the formation of bridges or as hanging of the furnace."

The italics in the quotation are the author's and are prompted by the question — what other result could be expected in view of proved carbon combustion reactions at the tuyeres?

Concentration Greater at Tuyeres —Coke carbon combustion reactions at the tuyeres, as proved and measured by United States Bureau of Mines research, were previously cited and illustrated with calculation in Part II. Inevitably, in any blast furnace, with the Btu generated from CO_2 formation in the primary stage of combustion, the concentration of Btu (temperature) will be greater at the tuyeres than in the secondary CO_2-CO reversion stage adjacent to it. Since gas produced from the combustion reaction is the agent for mechanical transfer of heat through the reversion zone to stock in the bosh, there will always be a relationship between rates of heat unit generation, gas flow, and heat unit absorption by stock. Previously it was shown by calculation how each 1 per cent substitution of oxygen for nitrogen in natural air will increase Btu generation from CO_2 and CO formation with virtually no increase in weight of gas produced. With conditions of the Totzek furnace operation, using 30 per

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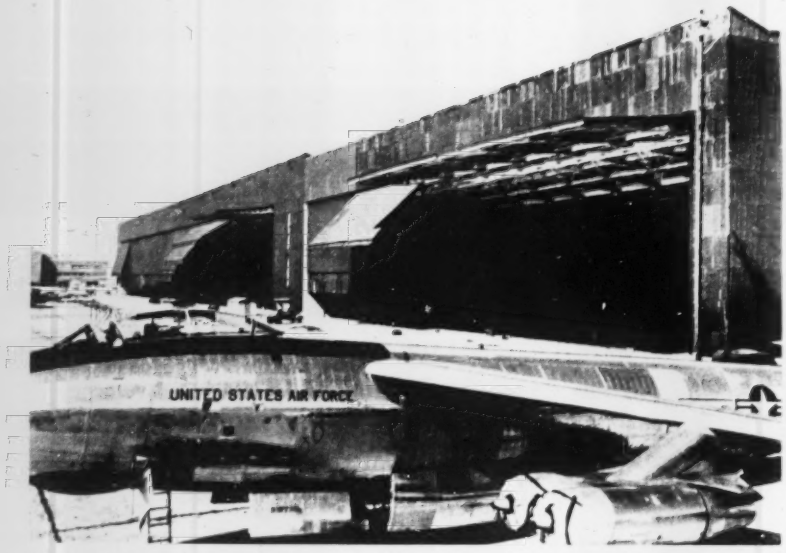

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cent oxygen (7 per cent above natural air content) heat and gas production from CO_2 formation compared to natural air combustion would be:

	Increase over natural air, %
Heat produced, Btu (7 x 4.07)	28.49
Gas weight produced (7 x 0.0032)	0.0224

With the substantial increase in Btu generation at the tuyeres and virtually no increase in weight of gas produced the rate of heat transfer through the CO_2-CO reversion zone would be materially reduced compared to natural air conditions.

Heat and gas production from CO formation, and transfer of heat from the CO_2-CO reversion zone to stock would be:

	Increase over natural air, %
Heat produced, Btu (7 x 4.34)	30.38
Gas weight produced (7 x 0.0064)	0.0448

With combustion conditions described, it is logical to expect greater concentration of heat at the tuyeres with use of oxygen-enriched air than with natural air, despite the need for heat beyond the dimensions of the CO_2-CO reversion zone. A condition commonly observed in normal furnace operation using natural air for blast may be used for illustration. Data have been presented showing tuyere temperature is normally higher than temperature of iron and slag tapped from the furnace. When a furnace goes cold tuyere temperature drops and the drop is readily apparent to the naked eye indicating the need for heat by stock has accelerated the normal rate of heat transfer from the combustion zone to stock. If the normal transfer rate is not restored the furnace will get completely out of control and cause sloppy tuyeres.

Details of Thermal Condition— The principle of a critical point of relationship between stock travel rate and stock heat absorption rate, which can be maintained only by regulating stock travel to conformity with the heat absorption rate, has been cited earlier in this discourse. With this commonly observed phenomenon in mind it is not difficult to visualize the thermal conditions described in the Totzek operation. Here the heat transfer from the combustion zone to stock was accelerated to the limit of the stock heat absorption rate but with the large percentage of increase in heat production rate (30.38 per cent) and virtually no increase in weight of gas produced (0.0448 per cent), plus the limitation to acceleration caused by the stock heat absorption rate, there was still sufficient excess of heat unit concentration in the CO_2 division of the combustion zone to cause temperature at the tuyeres higher than the temperature observed when natural air was used, despite the need for heat in the furnace beyond the dimensions of the combustion zone.

In the light of proved bosh and hearth reactions the comment in the Totzek patent specifications regarding silica is of interest:

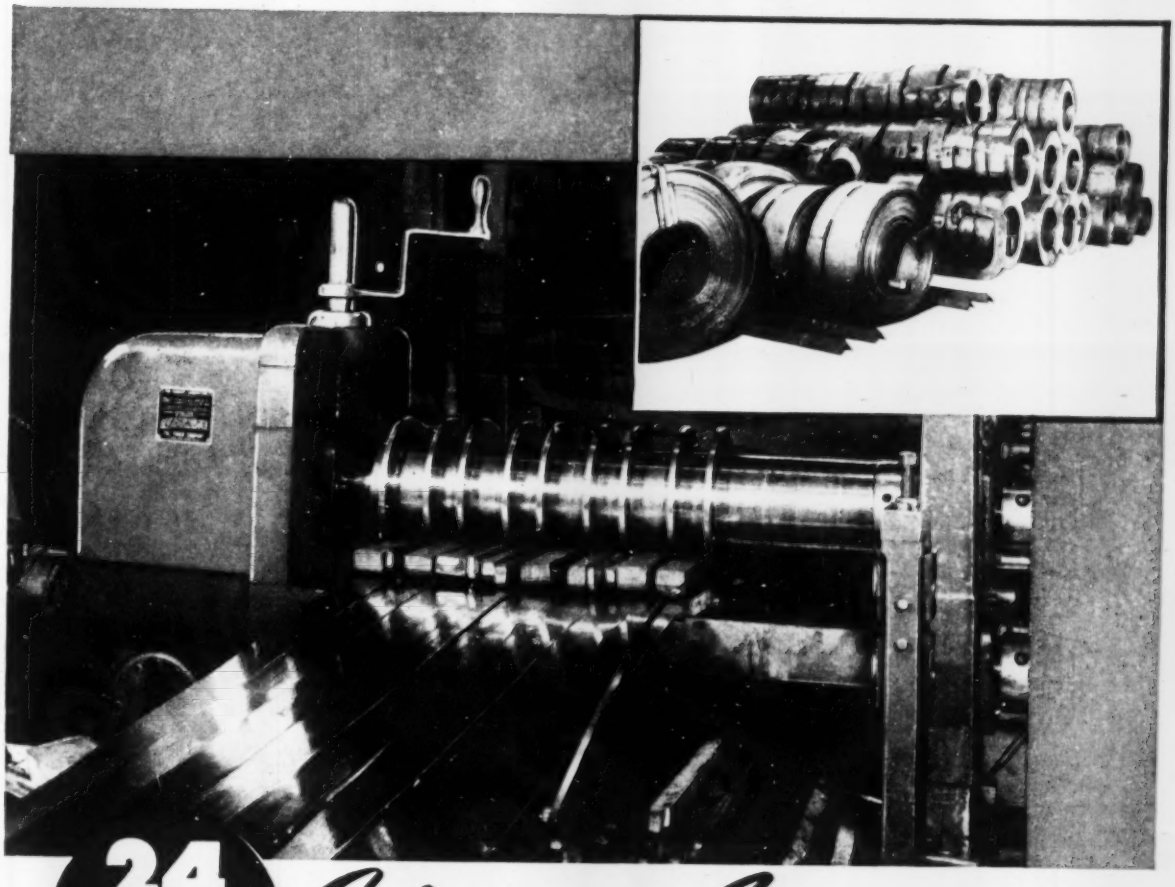
"Further, on a considerable increase of the oxygen content in the blast (that is with 30 per cent O_2 or more) there occurs near the tuyeres such temperatures that part of the slag, especially SiO_2 is evaporated and therefore the melting point of the slag is raised whereby the danger of the blast furnace freezing up, as has been mentioned before, is considerably increased."

When United States Bureau of Mines research recorded quantitative measurements of hearth and bosh reactions certain principles were proved which must apply to all coke blast furnaces:

1. The major percentage of silicon (Si) contained in iron cast from the furnace is reduced from silica (SiO_2) and enters the iron between the plane of initial fusion and a plane about 2½ feet above the tuyeres (just above the coke combustion zone).

2. Since combustion of coke carbon is confined to a relatively small zone adjacent to the tuyeres, coke ash released with carbon combustion is not available for assimilation by slag above the tuyere zone.

3. Since coke ash slag constituents are largely acids (SiO_2 and Al_2O_3) sufficient bases (CaO and MgO) must be carried through the bosh to flux the ash acids when released. Inevitably, with part of the silica in the mix being reduced to supply silicon for the iron, and presence of bases for fluxing ash acids, chemical composition of slag in any furnace is more basic in its stage of formation just above the tuyere zone than it is in its initial stage of formation, before any silicon reduction, or in the tapping stage after coke ash assimilation. Generally, when bases predominate in slag its melting temperature will be higher than when acids predominate. Because of these proved operating principles Totzek's observations regarding slag melting temperature are nor-



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mal ones and are not due to use of oxygen-enriched air for blast.

As means for correcting the ill effects from the use of 30 per cent or more oxygen in the blast the Totzek patent specifications advocate the following:

1. "According to one important feature of the invention these difficulties in the operation of a blast furnace with blast of increased oxygen content are overcome by introducing a gaseous medium capable of reacting exothermically with oxygen, such as carbon monoxide, besides the oxygen into the tuyeres in such a way as to enable the oxygen and carbon monoxide to mix with each other at the outlet of the tuyeres and, if possible, to react with each other.

2. "Introduction of carbon monoxide into the tuyeres of the blast furnace as provided by the invention leads to a temperature drop in front of the tuyeres and besides, but as an important effect, leads to a considerable extension of the fusing or oxidation zone in front of the tuyeres as compared with the extent of the fusion zone which is formed when blast highly enriched with oxygen is introduced through the tuyeres into the hearth of the blast furnace without the addition of carbon monoxide gas."

To effect the foregoing described conditions the specifications propose to increase the number of tuyeres and their arrangement:

"In the sense of this invention, the rule may be applied that the number of tuyeres provided in the hearth, when blast considerably enriched with oxygen is used, must be chosen in such a way that the comparatively small fusion zones which are formed in front of the tuyeres in the hearth touch each other and that there is a continuous annular zone of fusion in the hearth round the so-called dead man."

Introduction of carbon monoxide (CO) gas through the tuyeres with blast without first preheating it to the blast temperature would reduce blast temperature and thermal economy gained thereby. Source of monoxide gas is not specified but whatever the source its introduction into the blast before the stoves is ruled out because of the well-known disintegrating action of CO upon hot stove brick. However, these observations belong in the commercial phase of furnace operation and are not strictly a part of this discussion.

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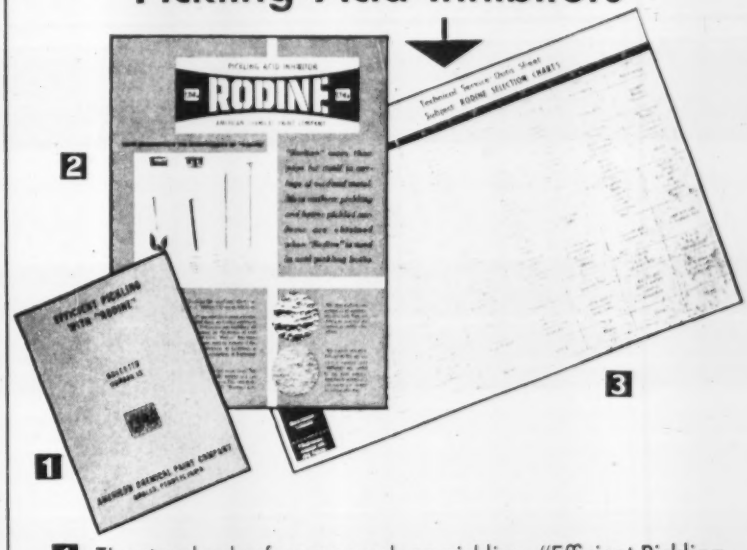

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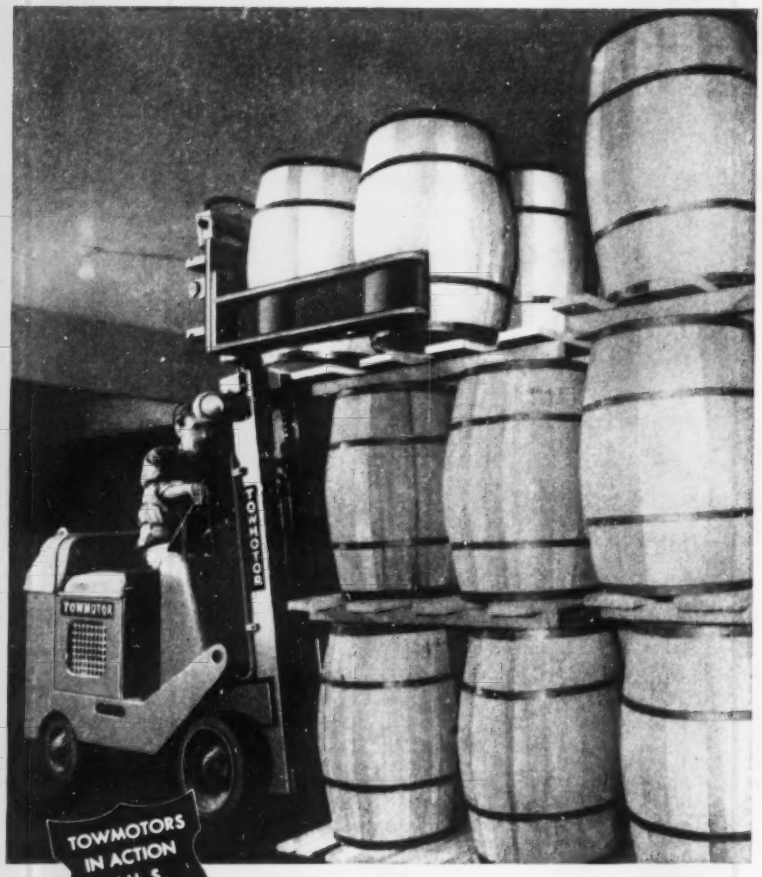

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technical phase of the subject the benefits expected from the introduction of auxiliary gas is a drop in the temperature in front of the tuyeres and an extension of the so-called fusion zone. This end is to be favored with spacing of tuyeres so there is a continuous annular zone of fusion around the furnace.

The so-called dead man is a central core of stock beyond the dimensions of the extended annular fusion zone. From the premise that the problem to be solved in Totzek's operation is one of heat volume and not one of temperature the means suggested by him as a solution are futile.

With addition to the number of tuyeres and application of monoxide gas in the manner described the patent specification states:

"In the sense of this invention, it is of no fundamental importance, with a blast furnace whose hearth is designed according to the invention, how the blast furnace is formed above the hearth, i.e., at the bosh and the shaft. Any suitable design of these parts of the blast furnace may be used, if it assures a regular downward movement of the charge. According to

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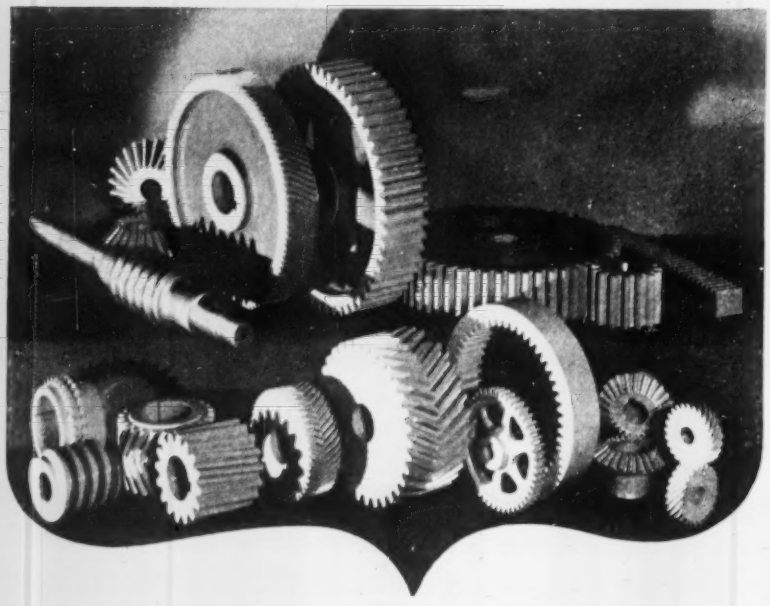

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the present invention, the upper portion above the hearth may be formed accordingly as required for certain contemplated operating conditions of the blast furnace, i.e., a relatively tall stack may be provided above the bosh, so that a relatively low temperature of the blast furnace gas at the upper outlet of the furnace may be attained, or the stack may be shortened, a higher temperature of the blast furnace gas at the upper end of the blast furnace thus being allowed."

In the sense that blast is applied at the hearth of a furnace, so constructed that raw stock will be charged above the hearth and seal off the coke combustion zone from the atmosphere, it is of fundamental importance to recognize four basic facts:

1. Development of blast furnace design over a period of six centuries has given consideration to the relationship between shaft and bosh and hearth dimensions.

2. So long as coke carbon is oxidized in a confined area where the products of combustion must pass through a mass of incandescent coke there will be the same combustion reactions, and the same limitation to heat unit generation per pound of carbon oxidized, as has existed for six centuries. Although the sequence of the combustion reactions was not proved and brought to light until comparatively recent years the fact of their prior existence is fundamental.

3. Division of the furnace which has the lesser productive capacity will govern productive capacity of the combined divisions.

4. Rate of coke carbon oxidation determines the rate of stock travel through the furnace. If the rate is faster than preparation principles will permit, first the shaft operation and, secondly, the bosh and hearth operation will become overloaded beyond their capacity to function.

In the light of these four items the relationship between shaft and bosh and hearth dimensions is always of fundamental importance to blast furnace design. If a furnace having dimensions of normal relationship could not prepare stock for smelting with the stock travel rate of Totzek's operation, certainly a low-shaft furnace could not do it. Requirements for correcting the Totzek phenomenon are:

1. An increase in the generation of heat units.
2. An increase in the heat absorption rate by stock.
3. Equitable division of the heat

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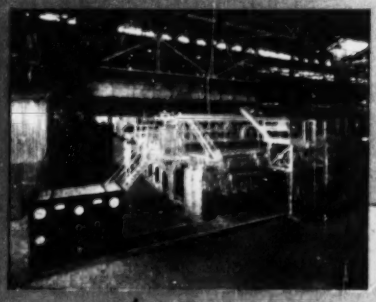

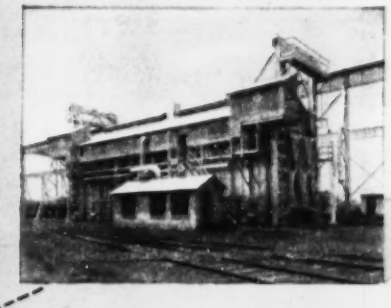

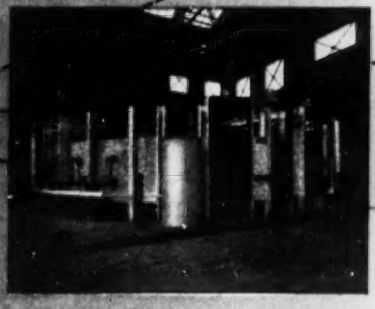

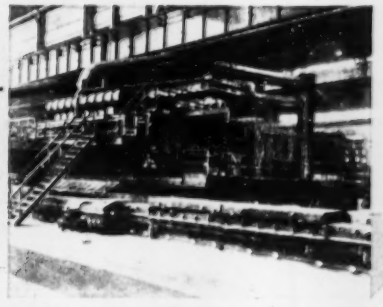

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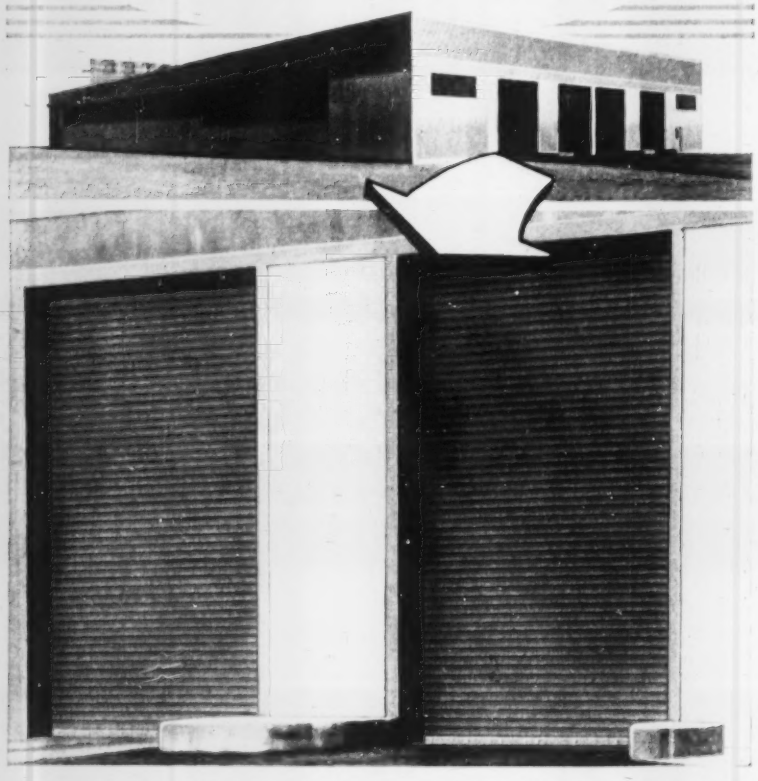

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Kinnear Rolling Doors open and close with smooth, time-saving ease *year after year*. They assure extra protection against wind, weather, intrusion, and fire. Available for manual or motor operation. Electrically operated doors can be equipped with control switches at any desired number of locations. Kinnear Steel Rolling Doors are built in any size, for easy installation in old or new buildings. *Write for full details today.*

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Turbojet Target

An Air Force sergeant readies the Ryan Q-2 pilotless target plant for flight at Holloman Air Development Center, Alamogordo, N. Mex. The turbojet craft is designed to simulate performance of piloted jet planes, but is less than half the size of a modern fighter. This view shows swept wings, air entry and Fairchild J-44 power plant

between shaft work and bosh and hearth work.

However, the use of additional tuyeres, and of auxiliary gas introduced into the furnace with the blast, in attempts to provide uniform dissemination of temperature in a zone adjacent to the tuyeres, does not change the basic principles governing carbon combustion at the tuyeres. Therefore, the hearth design recommended by Totzek cannot generate any additional heat units per pound of carbon burned, or provide means for equitable division of heat units between the shaft and the bosh and hearth operations. Since the heat absorption rate for each class of blast furnace raw materials is governed by natural laws, which are determined by chemical and physical properties of the materials, Totzek's design of hearth cannot change them.

Subject Undergoing Study—Apparently, the introduction of auxiliary gases into the blast furnace is being given consideration in the field of research, with the end conception being the use of blast furnace gas for the synthesis of hydrocarbons. This consideration

Ship ahoy

IT'S ALUMINUM ALLOY!

Aluminum alloys resist corrosion by sea water—they avoid troubles from warping, rusting or rotting. But that's only one reason aluminum is widely used in the construction of watercraft. Every vessel from a small boat to a big ship benefits from aluminum's light weight. For example, when you reduce the weight of a ship's funnels, deckhouses, or other superstructure, you increase the ship's stability. Then too, as with all forms of transportation, wherever you cut useless weight, you can carry more people or cargo. Aluminum's lightness also makes it easier, hence cheaper, to handle sections and subassemblies in the shipyard. Still another reason for using aluminum on ships is that it is nonmagnetic—it does not distort compass readings.

Aircraft and landcraft as well benefit with aluminum. Aluminum makes them easier to build...lighter . . . longer-lasting . . . lower-cost to operate and to maintain.

Because aluminum has so many desirable properties, it's in great demand for thousands of every day uses. But it's in even greater demand for transportation, military and other essential needs. Besides supplying millions of pounds of aluminum for security, we're doing our utmost to relieve the shortage of aluminum for all your needs.

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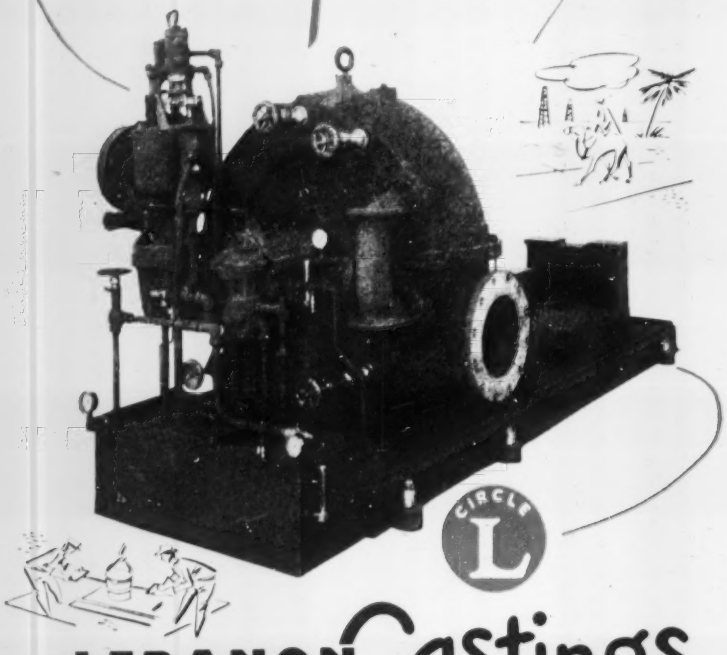

LEBANON Castings are at work

ON the lonely oil fields of the Saudi Arabian desert nine turbines break the stillness with their steady whine of work. These are Terry Steam Turbine Company's Type C.S. Turbines, and all the castings in these turbines are made by Lebanon Steel Foundry. Driven by waste gas from the oil fields, they power heavy-duty pumps that deliver 100,000 barrels of oil a day.

Operating at 280 F., 450 pounds pressure, the turbines, which are among the largest natural gas turbines in the world, develop a mighty 1940 H.P. at 4400 R.P.M. Terry Steam and their customer, the Arabian-American Oil Company, know that satisfactory service is doubly important when replacement parts are thousands of miles away and repairs are costly. You can be sure that these factors figured prominently in the selection of Circle (L) Steel Castings, products of true craftsmanship.

You should see — STEEL WITH A THOUSAND QUALITIES — A 37-minute 16 mm full color sound film on the making of steel castings. For information write: Dept. B, Lebanon Steel Foundry.

LEBANON Castings

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LEBANON STEEL FOUNDRY LEBANON, PA.

may have influenced preparation of the United Nations' technical report. Some of the Totzek patent specifications and claims indicate this ulterior purpose:

"Whether a blast furnace with a tall or with a low stack is to be used also depends on the composition of the blast furnace gas required. If a blast furnace with a tall stack is used the indirect reduction mentioned before attains a considerable extent and the blast furnace gas produced contains comparatively much carbon dioxide, whilst on the other hand the consumption of solid fuel diminishes. If, however, a blast furnace with a low stack is to be, or is, being employed the carbon dioxide content of the gas leaving the furnace is comparatively low and the gas may be used for chemical reactions, e.g., for the synthesis of hydrocarbons from carbon monoxide and hydrogen. If much carbon dioxide is contained in the gas it must be more or less removed before the synthesis of the hydrocarbons, e.g., by scrubbing the blast furnace gas with water under increased pressure. It is obvious that such difficult operation may be eliminated if a low stack blast furnace is used and consequently a gas poor in carbon dioxide is produced."

For the ulterior purpose just cited the patent specification proposes, in addition to the use of carbon monoxide gas to:

"Return a part of the gases leaving the top of the blast furnace to the tuyeres to use it as carbon dioxide gas as well, e.g., gas produced in a special gas producer, possibly using finely divided fuel."

Use of various combinations of hydrocarbon gases for synthesis purposes are described as certain to support the recommended change in furnace design:

"In any case, the addition of hydrocarbons, similar to the addition of carbon monoxide and hydrogen, results in a dilution of the oxygen in the hearth causing the extremely high temperature near the tuyeres to decrease and a more uniform distribution of heat in the hearth while extending the zone of fusion and oxidation correspondingly."

Based upon operating principles the introduction of auxiliary gases into the furnace, in the manner described or otherwise, would be detrimental to furnace operation and operating economy.

The foregoing analysis is offered in support of the statement that the low-shaft furnace design rec-

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HIGH SPEED—without sacrificing quality. Nut blanks need no subsequent operation except threading.

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SAFETY-INTERLOCKED LUBRICANT PUMPS—for machine and tools. Machine cannot be operated until lubricant is turned on.

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FOUNDED WATERBURY FARREL 1851

WF 2

Faith *in the sky*

Just child's play." Yes . . . but an interest is being born. First thoughts of flying came to the Wright brothers from a toy that was powered by rubber bands. From their boyish hands, the toy sailed through the air, and as it soared, their thoughts did, too. Today, faith in the sky comes naturally to American youth. It comes naturally to Ostuco, too. Though we are a pioneer in the development of steel tubing, we still have a youthful enthusiasm for new problems and new requirements. As a supplier to more than twenty leading American aircraft manufacturers, we have our sights set high. Our faith, too, is in the sky.

For detailed information on OSTUCO Aircraft Tubing, write for free Booklet A-2 and "Facilities" brochure. Address your nearest OSTUCO Sales Office, or write direct to General Office, Shelby 1, Ohio.

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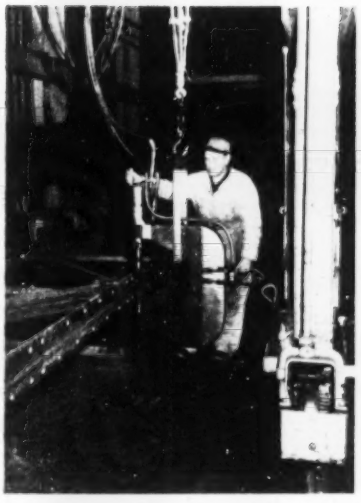


One-Man Riveting Crew

Clinton Bridge Corp., division of Allied Structural Steel Co., Clinton, Iowa, uses a hydraulic riveting setup and its own ingenuity to reduce the crew to one man. Clinton division bought a Hannifin riveter for maneuverability, refined the process by hanging the riveter on a gantry with directional crane controls on the yoke. The latter hangs from balancers for easy up-and-down motion

ommended in the United Nations technical report,[1] and the hearth design of the Totzek patent, with either a low-shaft or a high-shaft furnace, are both basically impractical in the technical phase of furnace operation.

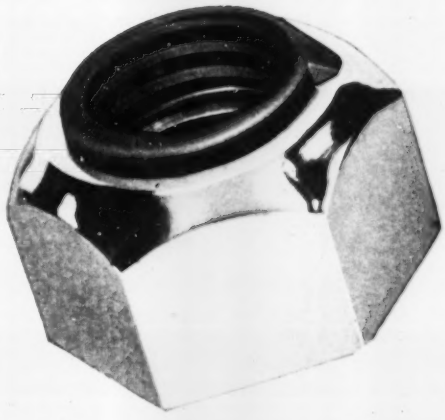
(To be continued)

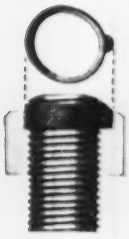
[1] Technical report on "Possibilities of Development in the Production of Iron" prepared for the United Nations Economic Commission of Europe, Geneva, July 1952, by Prof. Robert Durrer, Zürich Polytechnic and director of the Louis de Roll and Steel Works, Switzerland. An abstract of Prof. Durrer's article was presented in STEEL, Sept. 22, 1952, page 172.

Transistors Produced in West

Point contact transistors will be in full production and available for industry in June of this year, according to Hydro-Aire Inc., Burbank, Calif. The firm licensed to manufacture transistors by Bell Telephone Laboratories approximately a year ago, reports it will be the first western source.

Machinery that facilitates the production of this unit in large quantities has been perfected, including some of the latest types of test equipment, according to the company. A staff of engineers is available for consultation.





The picture above shows a cross-section of a Security Locknut. The insert, indicated removed, is of high quality heat treated, alloy spring steel and becomes a permanent part of the nut.

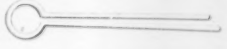
The insert is elliptical in shape and this design causes the retainer to grip the bolt with the terrific tension that only spring steel of great strength could exert and prevent the nut from turning. Simple—dependable—positive!

THERE IS NO OTHER FASTENER LIKE THIS!

WHAT IS YOUR TOUGHEST FASTENER PROBLEM?

That is the one we want to help you on. Security fastener experts have a long range of experience in problems where other fasteners would not hold.

Challenge us to make it stick!



ARE YOU COTTER CONSCIOUS?

There may be places where cotters are the only solution but cotters are expensive to install. Security Locknuts eliminate the adjustment of expensive castellated nuts, drilling and weakening bolts and setting cotters. You install Security like an ordinary nut.

WHY DESTROY THE BOLT?

Battered up bolt ends mean tough maintenance for your customer. Why peen bolt ends when you can lock the part in place in half the time and still permit easy removal.

ONE NUT DOES IT!

With Security it takes only one nut to hold the job. Just put it on like an ordinary nut. The Security retainer holds it in place and the nut body takes the load. Ask for more complete details. Let us tell you how it's made.

IF YOU are one of those people who believes a cotter pin is the only way to hold anything positively on a shaft you will be surprised at tests made on Security Locknuts. Authoritative tests have proved Security Locknuts practically vibration proof.

Security Locknuts stay "put" where you wrench them even in the face of vibration that destroys the bolt. They permit accurate adjustments with a torque wrench. They are complete as a unit. There is nothing to line up. Installation involves only one operation and there are no holes to weaken the bolt or stud.

Security Nuts can be adjusted and readjusted any number of times but more important, they can be *removed and re-used over and over again without materially losing their locking power and without damage to the bolt.* We'd like to have you see the results of these tests. If you have a vibration or fastener problem, Security Locknuts are a dependable solution and may save you money over methods you are now using.

Security Locknuts are made in ⅜ in. to 5 in. bolt sizes. Ask to see the Security Locknut Tests.

SECURITY LOCKNUT CORPORATION

North Ave. and 15th Ave., Melrose Park, Ill.

SECURITY LOCKNUT CORPORATION
1504 North Ave., Melrose Park, Ill.

Please send me without obligation:

☐ One of your Thread Tolerance Charts.

☐ We have a fastener problem and would like to know more about Security Locknuts.

Company Name

Address

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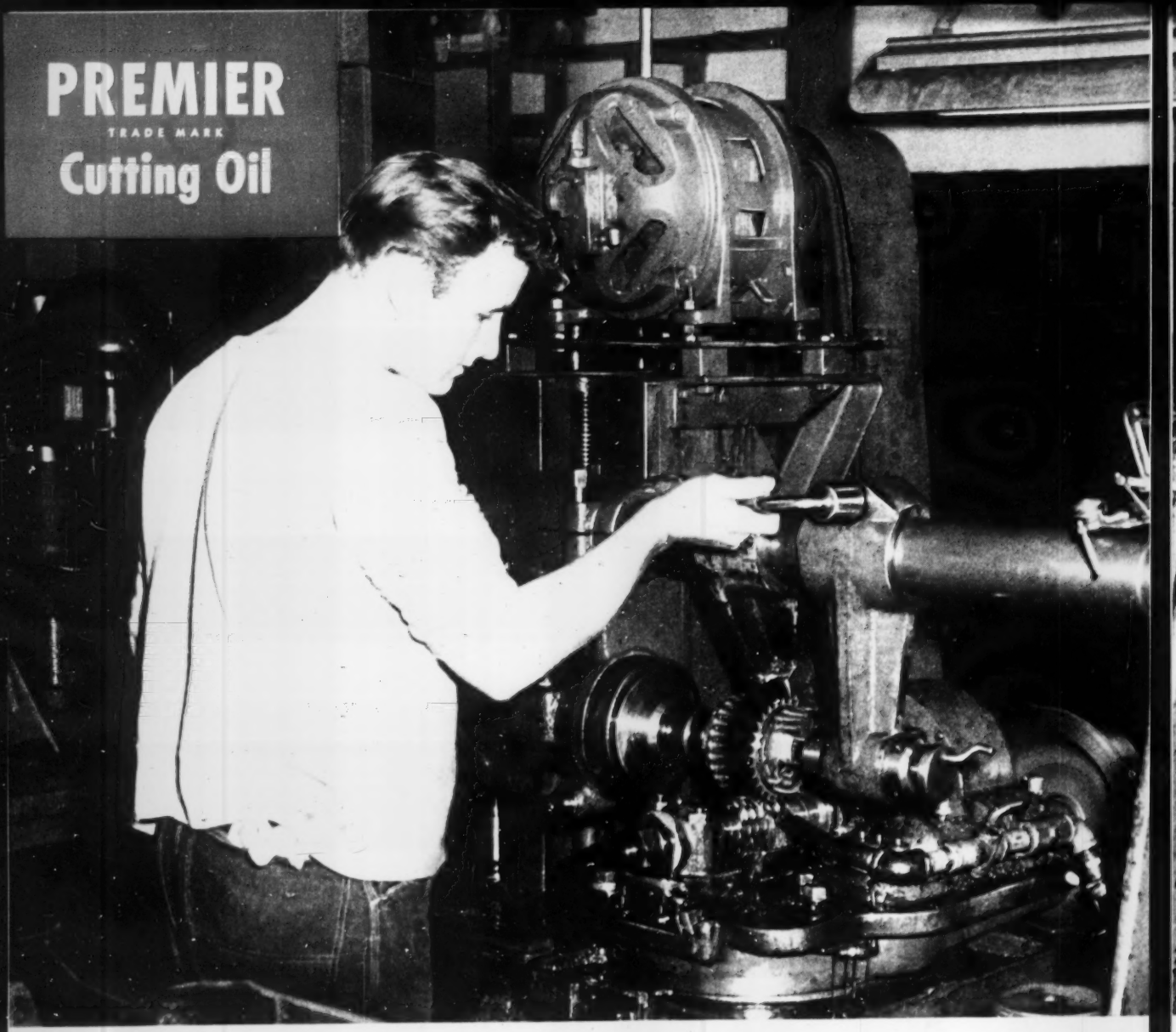
Security
The Nut You Can't Shake Loose

PREMIER
TRADE MARK
Cutting Oil



Hob life increased 75%

● The Gear Products Company, St. Louis, Missouri, tried various cutting oils for the hobbing of door latch spur gears from a free machining steel. With the best of the oils, an average of only 600 pieces could be produced before hobs required sharpening.

A Standard Oil lubrication specialist recommended PREMIER Cutting Oil, a light-colored, sulfurized cutting fluid. With the use of PREMIER, an average of 1050 pieces have been produced before hobs have required sharpening—a 75% increase of hob life. Less downtime for tool changes has resulted in higher production. Fewer sharpenings have significantly reduced tool costs.

The Gear Products Company, specializing in precision gears, gear trains, now uses PREMIER Cutting Oil for the majority of its gear cutting jobs. This has simplified both stocking and application of cutting oil.

Whether you have a specified problem or are looking for better results, there's a good possibility that a Standard Oil lubrication specialist can help you. His experience and special training are backed by one of the finest and most complete lines of cutting oils and lubricants on the market. You can contact him easily by phoning your local Standard Oil (Indiana) office. Or write: Standard Oil Company, 910 S. Michigan Avenue, Chicago 80, Ill.

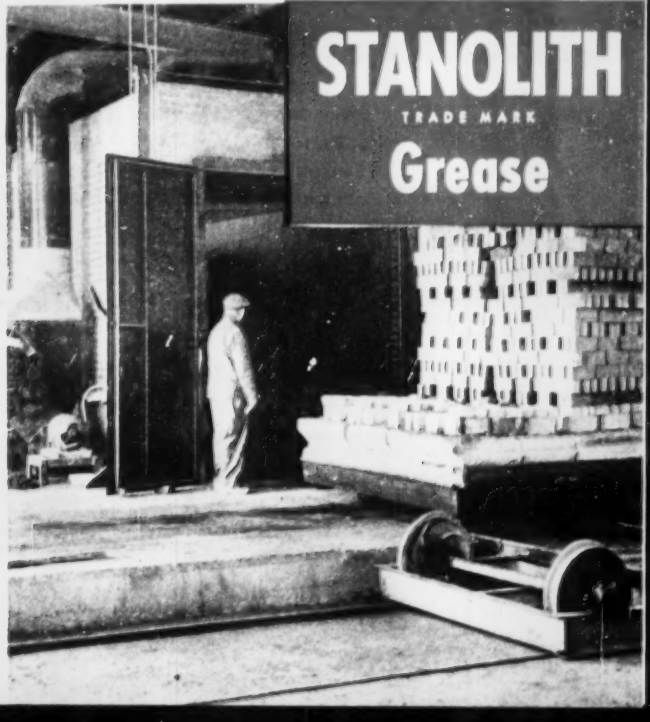
What's YOUR problem?

Fred. H. Moulton, lubrication specialist in Standard Oil's St. Louis office, worked closely with the Gear Products Company to help them get significantly greater tool life on the hobbing job described at the left.

To help you get better results with cutting oils and lubricants, Standard Oil has a corps of lubrication specialists located throughout the Midwest. One of these men is near your plant. He will give you the assistance you need when you need it. His wide experience and special training in the use of modern lubricants and cutting fluids will help you make real savings. You can reach him quickly and easily by phoning your local Standard Oil Company office. His services are backed by a supply set-up that is unique in the oil industry and that can mean convenience and savings for you.

Polishes off lubrication troubles! The automatic buffing machine, shown above, represents the engineering ingenuity of the McGraw Electric Company's Toastmaster Products Division, Elgin, Illinois, who designed the machine. Represented, too, in the successful operation of this equipment, is the work of a Standard Oil lubrication specialist. When various lubricants failed to give satisfactory lubrication of conveyor bearings, the Standard lubrication specialist came up with the answer: STANODRIP Dripless Oil. STANODRIP has stopped corrosion and gumming troubles and has reduced bearing wear to a minimum.

Stops high temperature troubles, cold! A midwest company was sweating out a problem of lubricating kiln car wheel bearings. Kiln oven temperatures approached 2000° F. and bearing temperatures were around 400° F. Greases tried on the job broke down to form carbon and gummy deposits. Recommended by a Standard Oil lubrication specialist, STANOLITH Grease has stopped troubles, cold! Carbon and gum troubles have been eliminated. Continuous use of kiln cars has permitted greater production.



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One unhardened and three surface hardened test blocks cut for inspection

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PITTSBURGH **Armored Gears** are guaranteed to give five times the life of untreated gears, one to one and one-half the life of oil-treated gears, and equal or longer life than any other gear in identical service. **Armored Gears** are quickly identified by their distinctive corrosion preventive coating of "**Pittsburgh Purple**."

Let us quote on one of your requirements. Then put the PITTSBURGH **Armored Gear** to work. See how much longer it lasts—and how much less your service cost is. Send your specifications today.

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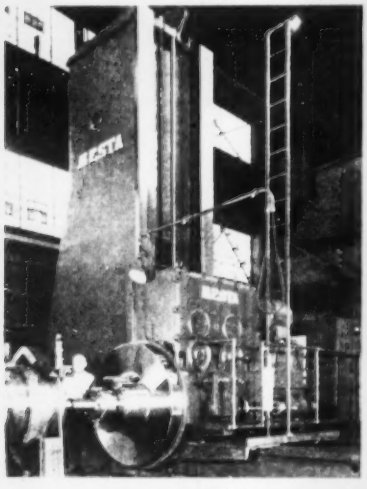
Heavy Press Assignment

Mesta builds its own equipment for machining sections of a 50,000-ton press

MULTI-PURPOSE machine tool equipment capable of executing its husky assignment in the U. S. heavy press program has been designed and built by Mesta Machine Co., Pittsburgh.

The firm will construct a 50,000-ton capacity hydraulic press for squeezing slabs of aluminum and magnesium into aircraft sections. To assemble the huge press, cast-



HORIZONTAL GIANT

. . . expedites heavy press work

ings weighing nearly 1 million pounds and forgings hammered out of ingots weighing more than ½-million pounds must be machined accurately.

The machine built for this job is a horizontal unit capable of boring, drilling, tapping and milling operations on these big press sections.

Holes 10 Feet Diameter — The machine can drill and bore holes from 3 inches to 10 feet diameter. Its 18-inch diameter spindle has a variable speed of 0.75 to 56 rpm and maximum 8-foot stroke. Necessarily designed for most rugged service, it has heavy cast construction throughout. Overall height reaches 24 feet, 3½ inches.

Machine proper consists of a main base with a moving column and saddle. Iron castings are made of close-grained air furnace iron, steel castings of acid open hearth steel. The column is arranged with

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BUILDS BETTER BULK MATERIALS HANDLING EQUIPMENT

For over three quarters of a century Brownhoist has engineered, designed and built boat unloaders, storage bridges, cranes and car dumpers for efficient handling of coal, ore and other bulk materials in practically every corner of the world.

Railroads, steel mills and dock operators interested in machinery for handling ore, coal or other bulk materials will find that it pays to discuss their requirements with Brownhoist engineers.

Brownhoist equipment includes unloaders, fast plants, traveling bridge cranes, Diesel and Diesel Electric locomotive cranes, clamshell buckets, car dumpers, car pushers, shipyard cranes, and related machinery.

BROWNHOIST BUILDS BETTER CRANES

160

COAL AND ORE BRIDGE

TRAVELING CRANE

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INDUSTRIAL BROWNHOIST CORPORATION
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horizontal rapid traverse and feed through a special bronze nut and forged steel screw along the bed for a distance of 30 feet. Weight of column and saddle on the ways is relieved by springs.

Vertical Travel: 13 Feet — Cast iron saddle mounted on the column side has vertical travel up to 13 feet. Vertical traverse and feed is obtained through a vertical screw. The saddle case encloses complete gearing for all traverse feed and tool motions. Hand levers, located conveniently on the outer case, control sliding gears.

Intricate Contour Broach

BROACHING setup developed by Colonial Broach Co., Detroit, permits use of standard broaching machines for broaching intricate internal contours of aircraft engine parts.

The six identical contours between internal lobes on the part are broached in two passes—three alternate contours in the first pass, the remaining three in the second. A two-station fixture is necessary to facilitate locating from offset holes in the part. The part is shifted to the second fixture, which is shuttled in broaching position for the second pass.

Built-up Broach — Another interesting feature is use of a built-up broach incorporating inserted broach sections. The machine is a standard 15-ton, 66-inch stroke pull-down single ram machine. Multiple guide shoes guide the broach above and below the part. These shoes contacting grooves in broach during vertical travel insure high dimensional accuracy.

Twelve dowels in the fixture, six above and six below, engage six holes in the six lobes in the part. Complete support of the six lobes thus is provided while the part is being broached, holding the thin walled projections to effectively prevent any distortion during the broaching operation.

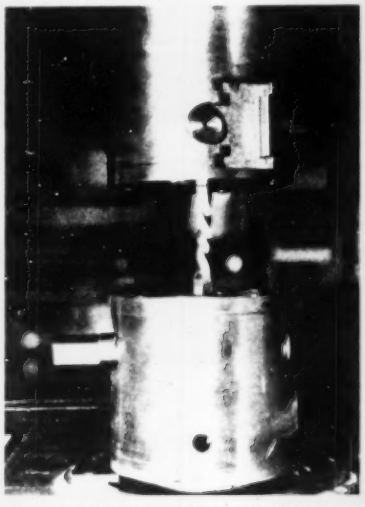
Limit Switch Control—The side shuttling fixture has a central opening through which the broach is returned after each pass. All movements of the shuttle are controlled and interlocked by limit switches, and operated hydraulically by the machine's hydraulic system.

Machine goes through one broaching cycle and returns automatically. It is then reactuated for the second pass to make sure the second fixture is loaded and in correct position for the next pass of the broach.

No Cracks at High Stress

DEVELOPMENT of an iron powder metal having improved ability to withstand high stresses without cracking is announced by Chrysler Corp.'s Amplex Division. A. J. Langhammer, division president, reports the product has several times the ductility of its previous iron powders and makes possible many new uses for such material.

Mr. Langhammer says Oilite has physical properties comparable to mild carbon steel, such as SAE



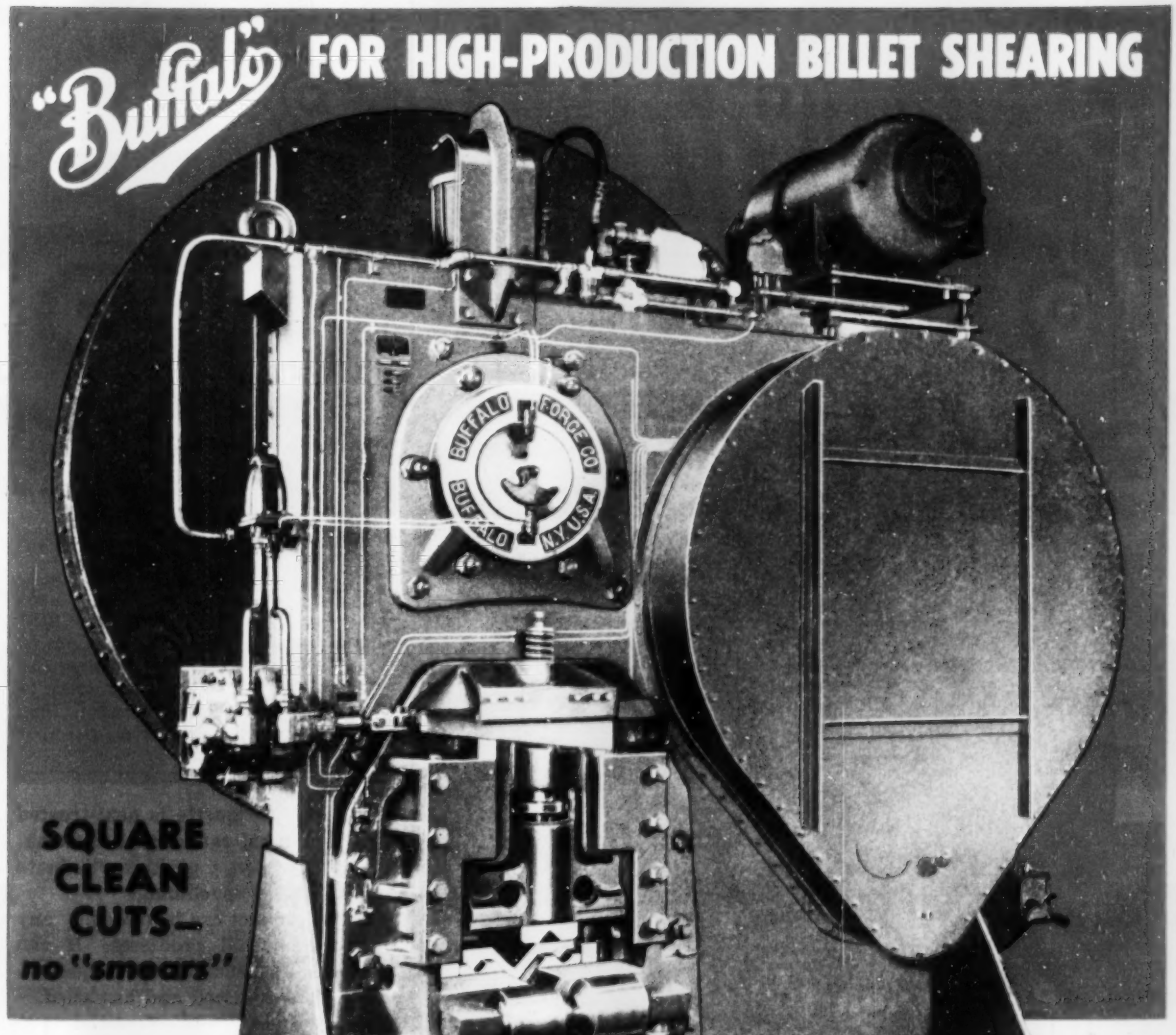
DUCTILE IRON POWDER
. . . *pressure maximum: 70,000 psi*

1010, 1020 or 1030. He points out that iron powders for regular usage withstand pressures of about 35,000 psi, but pressure maximum reaches 70,000 psi with the new product.

Applications—Good ductility and strength make it applicable for finished machine parts such as gears, cams, brackets and lever arms, according to the division. While retaining some porosity, the powder product is not intended for self-lubricating applications.

Parts are produced in a manner similar to the division's other metal powder work. An iron powder mixture is fed into a briquetting press and formed into exact shape

"Buffalo" FOR HIGH-PRODUCTION BILLET SHEARING



SQUARE CLEAN CUTS—
no "smears"

More and more firms are reducing their cost of forging blanks with "Buffalo" Billet Shears. Shearing speeds are fast — up to 30 cuts per minute, with automatic hold-downs and feed tables. Blank ends are square and clean with no "smears" or notches, because the knives penetrate only 5/16", localizing a sharp vertical fracture. Porosity is easily detected. For better forging practice, start with a "Buffalo" Billet Shear. Sizes up to 10" rounds and 9" squares. Write for Bulletin 529.

"Buffalo" MACHINE TOOLS

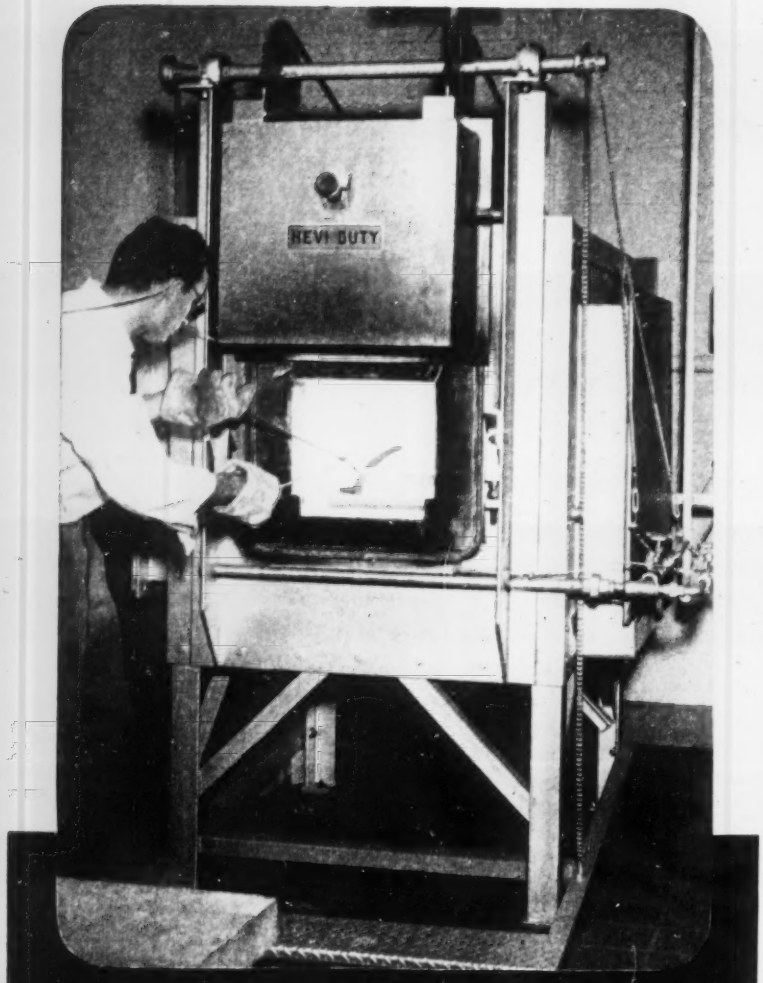
BUFFALO FORGE COMPANY

158 MORTIMER STREET BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DIAMOND JUBILEE 75TH ANNIVERSARY

DRILLING PUNCHING SHEARING CUTTING BENDING



Production Heat Treating Techniques are Determined in

HEVI DUTY FURNACES

A large automotive and ordnance manufacturer uses Hevi Duty high temperature furnaces in its metallurgical laboratory for determining production heat treating cycles.

These furnaces provide the uniform heat needed in this important work. Temperatures are accurately controlled to 2600° F. For day in day out production or precision laboratory work rugged Hevi Duty furnaces will meet your requirements. Write for bulletin IND-741 today.

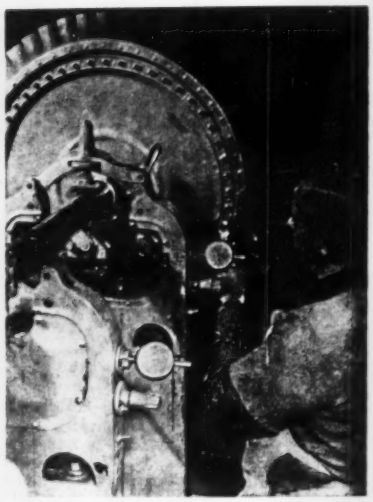
HEVI DUTY

HEVI DUTY ELECTRIC COMPANY

MILWAUKEE 1, WISCONSIN

Heat Treating Furnaces... Electric Exclusively

Dry Type Transformers *Constant Current Regulators*



Drive-Shaft Balancing

Piasecki Helicopter Corp. uses a 12-foot bed length balancing machine to balance drive shaft assemblies dynamically to within 1 inch-ounce at 1050 rpm. Built by Bear Mfg. Co., Rock Island, Ill., the machine also gives fan assemblies a running static balance to within 1 inch-ounce at 660 rpm. Time saved varies from 50 to 60 per cent

and size. Briquette is heat-treated to fuse metal particles, then finish-sized again in a press to eliminate necessity of machining.

The product can be plated by any of the normal processes. It can also be hardened by direct quenching, or carburized and hardened.

Putting Ideas to Work

A mechanism for "Putting Ideas to Work" is outlined in a booklet issued by Battelle Development Corp., Columbus, O.

The booklet points out ideas for technical development serve no one until they are put to work. Yet it is frequently difficult for a free-lance inventor or for research workers in universities and industry to find a way for developing their creative ideas.

The corporation is an instrument for putting such ideas to work. It is a wholly owned subsidiary of Battelle Memorial Institute, owning 226 United States and foreign patents, and 270 patent applications. It also has an interest in 35 other patents and patent applications. Several of the products and processes covered by the patents are available for licensing.

The Day the Cake Fell!

Just suppose all the nuts, bolts and screws were suddenly removed from a sparkling new range. A great deal more than a cake would fall—as the illustration above dramatically shows.

Yes, fasteners *are important*—and worth all the time and care you take in selecting those that are "just right" for your product. Lamson & Sessions is currently supplying most of the appliance manufacturers with bolts, nuts and screws—each type engineered to meet individual requirements.

Regardless of the product you manufacture; it will pay to take a critical look at the fasteners you are now using and ask yourself these questions:

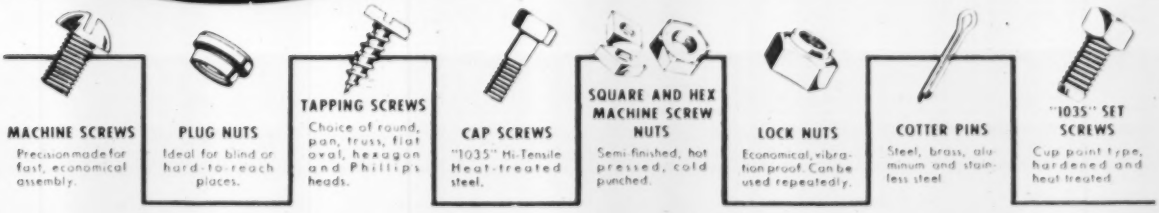
Can I save money by replacing a "special" with a "standard"? Or will the use of a "special" simplify production, thereby, saving time and perhaps materials?

Remember, whatever your problem, to check with Lamson & Sessions—one of the few manufacturers offering a *complete line* of fasteners teamed with expert engineering service.

The LAMSON & SESSIONS Co.
1971 West 85th St. • Cleveland 2, Ohio
Plants at Cleveland and Kent, Ohio • Birmingham • Chicago

Lamson & Sessions

FOR PROMPT DELIVERY AND HELPFUL SERVICE, ORDER FROM YOUR LAMSON DISTRIBUTOR



MACHINE SCREWS Precision made for fast, economical assembly.

PLUG NUTS Ideal for blind or hard-to-reach places.

TAPPING SCREWS Choice of round, pan, truss, flat oval, hexagon and Phillips heads.

CAP SCREWS "1035" Hi-Tensile Heat-treated steel.

SQUARE AND HEX MACHINE SCREW NUTS Semi-finished, hot pressed, cold punched.

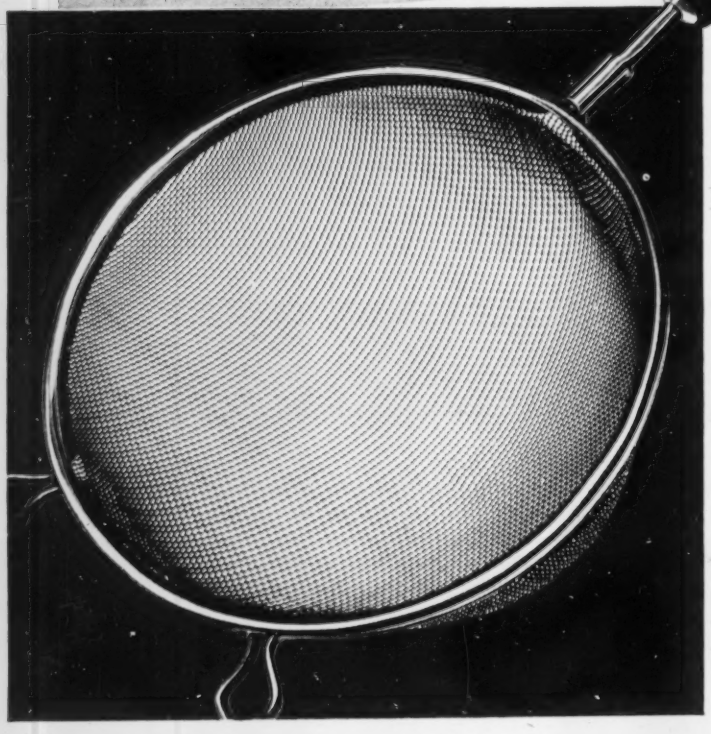
LOCK NUTS Economical, vibration proof. Can be used repeatedly.

COTTER PINS Steel, brass, aluminum and stainless steel.

"1035" SET SCREWS Cup point type, hardened and heat treated.

TINNED--
FOR PROTECTION

...in preparing and processing foods...beverages... and petroleum products



Why are kitchen strainers, tea strainers, flour sifters, french fryers, automatic dish washer baskets and many other kitchen tools made of Reynolds *tinned* wire cloth?

Because tinning means resistance to rust and tarnish resulting from contact with milk, water and atmospheric gases.

Tinned wire cloth is also resistant to phosphoric acid, ammonia, carbon tetrachloride, etc.; and substances present in motor fuels and other petroleum products.

And, wherever high speed soldering is a factor—as in electrical products—Reynolds tinned wire cloth is a natural.

Whether your products are used in the kitchen, dairy, food processing and preservation, or the beverage, petroleum, or electrical industries—you'll be interested in Reynolds Wire Cloth. And, tinning is only *one* of the many special-needs demands that *Reynolds* Wire Cloth is or can be made to meet. Consult Reynolds engineers. No obligation.

Reynolds CLOTH

protects performance

REYNOLDS WIRE DIVISION, NATIONAL-STANDARD CO., **DIXON, ILLINOIS**

Divisions of National-Standard Co.

ATHENIA STEEL...*Clifton, N. J.*	Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD...*Niles, Mich.*	Tire Wire, Fabricated Braids and Tape
WAGNER LITHO MACHINERY...*Jersey City, N. J.*	Metal Decorating Equipment
WORCESTER WIRE WORKS...*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes

NS NATIONAL-STANDARD Company NILES MICHIGAN

CALENDAR
OF MEETINGS

March 31-April 2, The Magnesium Association: International magnesium exposition, National Guard Armory, Washington. Association address: 122 E. 42nd St., New York 17. Secretary: Martha I. Hanson.

April 7-9, Steel Shipping Container Institute: Annual meeting, Biltmore hotel, Palm Beach, Fla. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

April 8-10, Society of the Plastics Industry Inc.: Pacific Coast conference, Last Frontier hotel, Las Vegas, Nevada. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

April 9-10, Malleable Founders' Society: Market development conference, Cornell University, Ithaca, N. Y. Society address: Union Commerce Bldg., Cleveland 14. Managing director: Lowell D. Ryan.

April 9-11, Lead Industries Association: Annual meeting for members, The Greenbrier, White Sulphur Springs, W. Va. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 12-15, American Supply & Machinery Manufacturers Association: Annual meeting and conference booth program, Hotel Columbus, Miami, Fla. Association address: 814 Clark Bldg., Pittsburgh 22. Secretary: R. Kennedy Hanson.

April 12-16, Electrochemical Society Inc.: Annual spring meeting, Hotel Statler, New York. Society address: 235 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.

April 13-15, International Acetylene Association: Annual spring meeting, Hotel Biltmore, Atlanta. Association address: 30 E. 42nd St., New York 17. Secretary: H. F. Reinhard.

April 13-15, American Society of Lubrication Engineers: Annual meeting and exhibit, Hotel Statler, Boston. Society address: 343 S. Dearborn St., Chicago 4. Secretary: William P. Youngclaus Jr.

April 14-15, Westinghouse Machine Tool Electrification Forum: Annual session, Hotel Statler, Buffalo. Information: E. F. Grapes, technical publicity, Box 2278, Pittsburgh 30.

April 14-16, Conveyor Equipment Manufacturers Association and University of Illinois Department of Engineering: Conveyor institute, University of Illinois, Champaign, Ill.

April 16-17, American Machine Tool Distributors Association: Spring meeting, Netherland Plaza hotel, Cincinnati. Association address: 1900 Arch St., Philadelphia 3. Secretary: Thomas A. Ferneley Jr.

April 16-17, The Wire Association: Regional meeting, Stacy-Trent hotel, Trenton, N. J. Association address: 105 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

April 16-19, Grinding Wheel Institute: Spring meeting, The Homestead, Hot Springs, Va. Institute address: 2130 Keith Bldg., Cleveland 15. Manager: Hunter-Thomas Associates, Ira F. A. Peterson.

April 18-19, Packaging Machinery Manufacturers Institute: Spring meeting, Hotel Sherman, Chicago. Institute address: 342 Madison Ave., New York 17. Secretary: Helen L. Stratton.

April 19-23, American Hardware Manufacturers Association: Spring meeting, Hotel Adolphus, Dallas. Association address: 342 Madison Ave., New York 17. Secretary: Arthur L. Faubel.

April 20-22, Metal Powder Association: Annual meeting and exhibit, Hotel Cleveland, Cleveland. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 20-22, AIME Blast Furnace, Coke Oven & Raw Materials Committee and National Open Hearth Steel Committee: Annual conference, Hotel Statler, Buffalo. Institute address: 29 W. 39th St., New York 18.

April 20-23, American Gas Association: National Packaging Exposition, Navy Pier, Chicago. Association address: 350 W. 42nd St., New York 36. Information: Donald G. Keer.

April 20-23, National Screw Machine Products Association: Spring meeting, Hotel St. Moritz, New York. Association address: 2860 E. 130th St., Cleveland 20. Secretary: Orrin B. Werntz.

April 20-23, Society of Automotive Engineers: Aeronautic production forum, national aeronautic meeting, and aircraft engineering display, Hotels Governor Clinton & Statler, New York. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

April 21-23, Caster & Floor Truck Manufacturers Association: Spring meeting, Edgewater Beach hotel, Chicago. Association address: 27 E. Monroe, Chicago. Secretary: H. P. Dolan.

April 22-23, American Institute of Steel Construction Inc.: Spring engineering conference, Detroit Engineering Society Bldg., Detroit. Institute address: 101 Park Ave., New York 17. Executive vice president: L. Abbett Post.

April 25, American Society for Metals, Indiana Chapters: Annual spring symposium, Purdue University, W. Lafayette, Ind. Information: A. D. Carvin, Joslyn Stainless Steels, Ft. Wayne, Ind.

April 27-28, Copper & Brass Research Association: Annual meeting, Drake hotel, Chicago. Association address: 1426 New York Ave. NW., Washington 5. Corresponding secretary: Mrs. Elizabeth Dyer.

April 27-May 8, British Industries Fair: Castle Bromwich, Birmingham, and Earls Court, London, Eng. Information: Larry Nixon, 37a Madison Ave., New York 22.

April 29-May 1, Radio Television Manufacturers Association: Electronic Components Symposium, Shakespeare Club, Pasadena, Calif. Association address: 777 14th St. NW., Washington 5.

May 4-6, National Small Businessmen's Association: Annual meeting, Hotel Mayflower, Washington. Association address: Evanston, Ill. Vice president: A. W. Kimball.

GLOBE Seamless
GLOWELD Welded

- Resistance to Corrosion
- Strength at High Temperatures
- Resistance to Oxidation at High Temperatures
- Ease of Fabrication

TYPICAL ANALYSIS AND TYPES:

302	309S	316 Ti	330	410
302B	309 Cb	317	347	430
304	310	321	403	443
308	314	329	405	446
309	316	INCONEL*	NICHROME**	

*Registered U. S. Trade mark
**Trade Mark Reg. U. S. Pat. Off. by Hoskins Mfg. Co.

Globe produces more than 26 standard analyses of stainless steel tubes — also special analyses when required. Because varying analyses have widely varying service characteristics, Globe will make recommendations only after careful study of your particular problem or application.

GLOBE
specialization...
meets your exact requirements in
STAINLESS STEEL TUBES

Write for Bulletin 311 Corrosion and Heat Resisting Steel Analyses Chart — a valuable reference tabulation of stainless steel analyses as produced by various manufacturers.

Piercing, rolling and reduction of seamless tubes is closely monitored from this control room — typical of the highly specialized equipment in the Globe mill.

SIZE RANGE:

Globe seamless stainless steel tubing — sizes ⅛ inch to 6 inches O.D., pipe sizes ⅛ inch to 6 inches, standard, extra strong and double extra strong weights.

Globe electric welded stainless steel tubing — sizes ⅛ inch to 5 inches O.D. Standard weight pipe (schedule 40) sizes ⅛ inch to 2 inches. Lightweight pipe (schedule 5 and 10) ⅛ inch to 8 inches.

TOLERANCE RANGE:

All stainless tubing furnished to standard A.S.T.M. specifications unless otherwise specified to suit your particular application requirements.

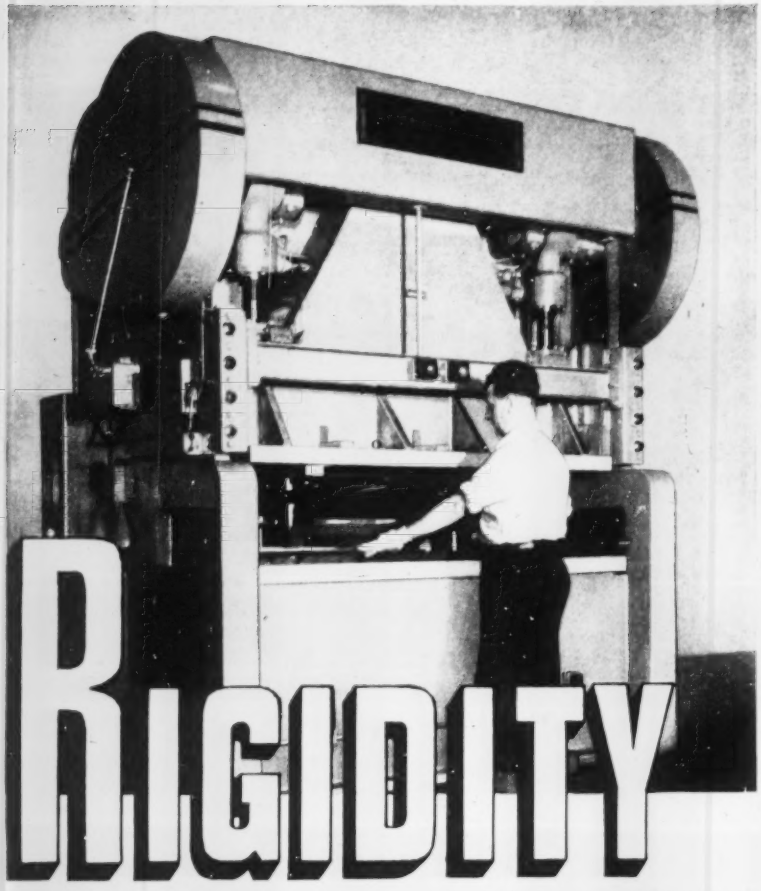
Globe specialization gives you uniform high quality . . .

Precision checks — and re-checks — at every stage of production insure Globe stainless steel tubes that meet your exacting specifications. For more than thirty years, specialization in production of steel tubes has keynoted all Globe research, engineering and mill operations. Write for the Globe Stainless Steel Tubes catalog.

GLOBE STEEL TUBES CO.
Milwaukee 46, Wis.

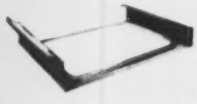
Chicago • Cleveland • Detroit • New York
Philadelphia • St. Louis • Denver • Houston • San Francisco • Glendale, Cal.

Producers of Globe seamless stainless steel tubes, tube reducing machines, steel tubes, Globe electric welded stainless steel tubes, Globe-Electric finish-ground and seamless tubes, Globe welding fittings.



RIGIDITY

AND WIDE BED AREA MAKE THE BATH PRESS TYPE BRAKE IDEAL FOR BLANKING . . . PIERCING . . . SHALLOW DRAW



THE RIGIDITY of the Bath Press Type Brake is evidence of its high standard of construction. With speeds of 45 or 60 strokes per minute, it has many outstanding advantages such as Overload Protection, Pneumatic Clutch-Brake, End Feeding, Serial Operation etc.

The one piece welded frame, with closed side housings, makes for perfect die alignment, which means stamping, bending etc. to very close measurements. Slide areas are large, about four times those in ordinary bending presses, adequate for most of the difficult blanking, stamping and punching operations. Ram and bed working areas are flush with the forward housing and easily reached by the operator.

Under a heavy production schedule the efficient and economical operation of the Bath Press Type Brake increases production and offsets losses incurred elsewhere.

For further information and specifications on the Bath Press Type Brakes write for this catalog.

THE CYRIL BATH COMPANY

MANUFACTURERS of METAL FORMING MACHINERY

6972 MACHINERY AVE. • CLEVELAND 3, OHIO

MEN OF INDUSTRY

R. LESLIE MULLEN
. . . asst. to president of Lehigh Structural

(*Continued from Page* 78)

Don McLeod western representative with offices in Los Angeles.

R. Leslie Mullen, vice president of **Lehigh Structural Steel Co.** and its subsidiaries, Allentown, Pa., was made assistant to the president.

Elmer T. Meyer was appointed assistant manager, agricultural division, **Crucible Steel Co. of America,** Pittsburgh. He formerly was purchasing agent and director of traffic for B. F. Avery Division, Minneapolis-Moline Co.

A. W. Jacobson was made manufacturing manager for pilotless aircraft at **Boeing Airplane Co.,** Seattle. **W. E. Ramsden** was appointed experimental department manager.

Ira E. Johnson was named general manager of the new **Chrysler Corp.** engineering proving grounds near Chelsea, Mich., and **Arnold Steckling** was made chief engineer and assistant to the general manager. **Wallace E. Zierer** will be supervising experimental engineer.

M. J. Kilhoff succeeds **Edward H. Horstkotte,** retired, as manager of the locomotive and car equipment laboratory at **General Electric Co.'s** Erie, Pa., Works.

Dr. William E. Cass was named manager of the new product development laboratory of **General Electric Co.'s** chemical division, Pitts-

WHICH OF THESE QUALITIES DO YOU WANT MOST IN CUTTING FLUID?

. . . . LUBRICITY
—to withstand pressure and reduce friction

. . . . VERSATILITY
—one cutting fluid to do 90% of all jobs

. . . . GERMICIDAL PROPERTIES
—no skin sores, no rancid odors

. . . . FILM STRENGTH
—which gives you longer tool life

. . . . COOLER WORK
—which can be handled bare-handed

. . . . LOWER COSTS
—less than 8¢ a gal., in the machine

YOU GET THEM *ALL* WITH

ANTISEP

ALL-PURPOSE BASE

—not a mere water soluble oil, but a fortified concentrate scientifically developed to give you "100 oils in one!"

PROMINENT AUTOMOTIVE MANUFACTURER MAKES 25,000 PIECE TEST... *Result...*

ANTISEP by wide margin!

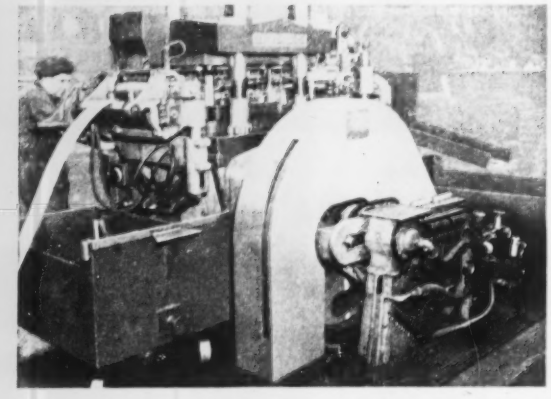
Test consisted of broaching 25,000 pieces of SAE 1138 steel at a feed of 18 feet per minute, on a Cincinnati Broach. Antisep was diluted 15 to 1 with water. Competitive Oil "A" was used in a mix of 18.5% oil, 81.5% Paraffin; Oil "B" was also mixed with Paraffin on a 23.7% to 76.3% ratio. The cost comparison below shows Antisep's exceptional economy . . .

	OIL "A"	OIL "B"	ANTISEP BASE
Coolant	$45.70	$54.20	$14.80
Sharpening and Setup	26.80	27.49	26.26
Tool	139.69	137.55	134.76
Total Cost	$212.19	$219.24	$175.82

E. F. HOUGHTON & CO.
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

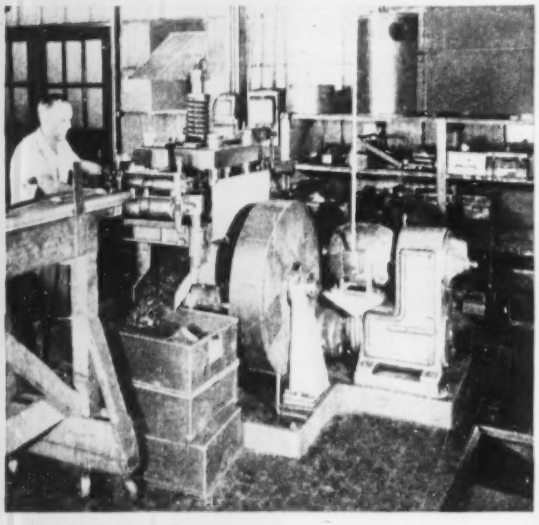
Modernize Metal Stamping
with Henry & Wright Dieing Machines



IT PAYS 3 BIG WAYS

1. ***Combine operations - - use progressive stamping more efficiently, for more parts***
2. ***High quality work at high speed***
3. ***High speed plus long die life***

In Chrysler's Highland Park plant (above), Henry & Wright Dieing Machines are used to make fluid coupling fins and torque converter impeller blades. At Knapp Monarch (below), Dieing Machines produce rotor and stator laminations complete per stroke.



In Plant After Plant Henry & Wright Dieing Machines are setting new record highs in the number of pieces produced per hour, in work quality and die life. A high production tool, this unique press is proving that it can do as much work as five to ten conventional presses. It provides both high speed and long die life—a combination unavailable in any other press.

Only the best is good enough

Capacities of Henry & Wright Dieing Machines range from 25 tons to 2500 tons pressure. Our catalog available upon request describes machines up to 400 tons. Larger capacities are custom built to requirements. Write Henry & Wright, 461 Windsor St., Hartford 5, Conn.

HENRY & WRIGHT
Division of Emhart Mfg. Co.

JOHN STOLARZ
. . . rejoins DeWalt Inc.

field, Mass. He has been manager of the organic chemistry section of the GE research laboratory.

John Stolarz rejoins **DeWalt Inc.**, Lancaster, Pa., subsidiary of American Machine & Foundry Co., as industrial sales manager. Formerly general sales manager, he left DeWalt in 1949 to become a divisional sales manager of Delta Power Tools Division, Rockwell Mfg. Co., where he served successively as sales promotion manager, assistant general sales manager and general sales manager.

Frank G. Fisher, vice president and assistant general manager, **Houdaille-Hershey Corp.**, Detroit, was promoted to general manager.

L. R. Fletcher was made sales manager, welding steels division, **Pyramid Steel Co.**, Cleveland.

Albert H. Clem was appointed general sales manager, **Pennsylvania Salt Mfg. Co.**, Philadelphia, replacing the late **Russell S. Roeller.**

C. Harold Johnson has joined **Peninsular Grinding Wheel Sales Corp.**, associated with the Cleveland office.

Richard H. Oberholtzer is manager of the Milwaukee district office, **Kennametal Inc.**, to succeed **Carl Wheelock**, resigned.

Laystrom Mfg. Co., Chicago, elected **A. A. Wiser** vice president in charge of sales, and **Arthur Karsel** secretary and a director.

KENNAMETAL
"BUTTON" TOOLS

Mounting Screw permits easy rotation of insert without changing tool setting
Sturdy Kennametal insert—indexable to several cutting positions
STYLE PRC
STYLE SDH
STYLE RDH

UNBUTTON
Production Tie-Ups

Get acquainted with this new tooling technique that handles jobs ranging from profiling to planing—gets more work done with less carbide, uses simplified tool designs, and greatly reduces grinding expense. Here are typical applications:

PLANING: Machine tool builder reports heavy duty button tools cut time of planing 15-foot gray iron castings from 86 to 41 minutes.

BORING: Car wheel maker records up to 200 wheels bored before set of four heavy duty Kennametal buttons need resharpened.

PRODUCTION JOB: Tractor accessory shop faces to length and chamfers both ends of more than 3600 actuating cylinders with set of three buttons.

Performance reports on these and other "button-tooled" jobs will be sent—or our field engineer will give you complete information—on request. Kennametal Inc., Latrobe, Pa.

KENNAMETAL
CEMENTED CARBIDE TOOLING
THAT INCREASES PRODUCTIVITY

The U. S. Steel Supply team that gives you *personalized service*

...*our salesman*

puts this team to work for you!

SUPPLYING YOUR STEEL requirements becomes our team objective when you tell your needs to your U. S. Steel Supply salesman. Behind your salesman is a team of technical experts, each one a specialist in his field . . . and your business receives the attention of every member of the team who can contribute to its progress.

What do you need? Steel? Tools? Special-purpose equipment or machinery? Advice on working an unfamiliar type of steel? Help in meeting a pressing delivery date? Give your order to your U. S. Steel Supply salesman. He will see that it gets immediate attention from the U. S. Steel Supply specialists best qualified to serve you.

YOUR "ONE CALL" SOURCE OF STEEL SERVICE

U.S. STEEL SUPPLY

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HEADQUARTERS: 208 So. LA SALLE ST., CHICAGO 4, ILL. WAREHOUSES AND SALES OFFICES:

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NEWARK • PITTSBURGH • PORTLAND, ORE. • ST. LOUIS • TWIN CITY (ST. PAUL) • SAN FRANCISCO • SEATTLE
Sales Offices: INDIANAPOLIS • KANSAS CITY, MO. • PHILADELPHIA • PHOENIX • ROCKFORD, ILL. • SALT LAKE CITY • SOUTH BEND • TOLEDO
TULSA • YOUNGSTOWN

USS

UNITED STATES STEEL

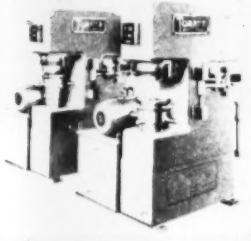
NEW PRODUCTS and equipment

Reply cards on page 141 will bring you more information on any new products and equipment in this issue

Hydraulic Assembly Press

. . . maintains center distances

Accurately maintaining center distances in assembling inner portions of fluid couplings is one function performed by this 50-ton hydraulic assembly press. Ram on the assembly press is set with an indicator, the stroke electrically



and hydraulically controlled so assembly of tree members is maintained accurately. Turner Bros. Inc., Dept. ST, 2625 Hilton Rd., Ferndale, Mich.

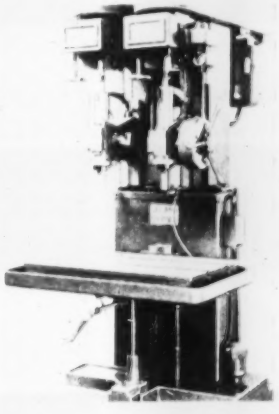
FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Heavy-Duty Drilling Machine

. . . power, hand, hydraulic feed

Power, hand or hydraulic feeds are available for the No. 3 MVB heavy-duty drilling machine. The machine drills holes to $1\frac{1}{4}$ inches diameter in steel or $1\frac{1}{2}$ inches in cast iron. It has 24-inch swing, capacity for No. 3 or 4 Morse taper and from one to four spindles.

Power feed has three feed rates, adjustable depth stop and safety slip clutch. The hydraulic feed has either plain or step-by-step controls. A four-speed motor with back gears provides eight standard speeds. A single-speed motor, with or without back gears, or a four-speed motor without back gears are also available. On multispeed machines, all speed changes including back gear shifting, are made instantly without stopping the ma-

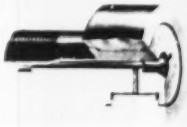


chine or the operator moving from position. Leland-Gifford Co., Dept. ST, Worcester 1, Mass.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Cam Follower Roller

. . . stud diameter increased



Built specially to meet heavy duty requirements, this type CTA cam follower roller provides a stud that has large diameter with relation to roller size. Integral flange on the stud makes it possible to increase stud diameter and assures strength demanded in special applications where high speed and heavy load-carrying capacity are essential.

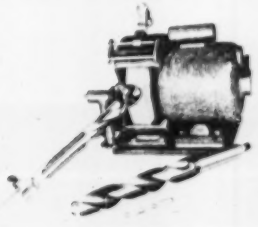
Stud diameter can be specified larger or smaller to fit particular requirements. Stud is case hardened in the bearing section, left soft on the threaded end to prevent snapping under impact or pressure. Smith Bearing Co., Dept. ST, 23 Bear Tavern Rd., W. Trenton, N. J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Twist Drill Grinder

. . . two holders take all sizes

Increasing life and efficiency of two-flute twist drills and reducing material spoilage due to imperfectly drilled holes are the functions of the model 200 twist drill grinder. The grinder requires only two hold-



ers to sharpen all sizes of straight or taper-shank twist drills from $\frac{1}{8}$-inch to $1\frac{1}{2}$ inches.

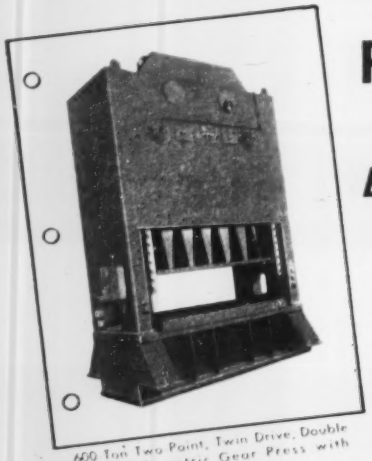
An infinite range of point angles for drilling different material types is obtained instantly by a simple one-knob adjustment. Compensation for wheel wear is made automatically. A built-in diamond wheel dresser is standard equipment. Alden Industries, Dept. ST, 1400 Sackett St., Cuyahoga Falls, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

Sprocket, Roller Chain Line

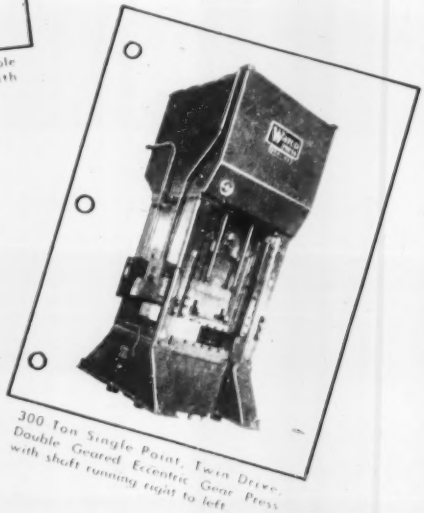
. . . employs Taper-Lock principle

Off-the-shelf availability to roller chain drives is accomplished with a line of sprockets and roller chain that marks the manufacturer's entry into the roller chain drive field. Instant availability is achieved by

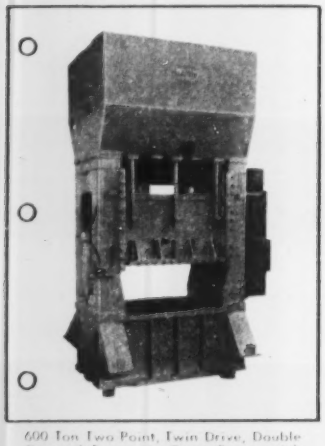


600 Ton Two Point, Twin Drive, Double Geared Eccentric Gear Press with shafts running front to back

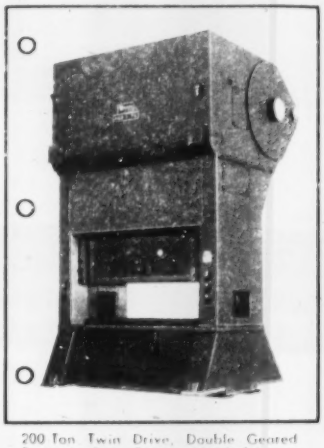
FOUR of the MANY Warco ECCENTRIC GEAR PRESSES WORKING TODAY



300 Ton Single Point, Twin Drive, Double Geared Eccentric Gear Press with shaft running right to left



600 Ton Two Point, Twin Drive, Double Geared Eccentric Gear Press with shafts running right to left



200 Ton Twin Drive, Double Geared Eccentric Gear Press with shafts running right to left

Here are four pages from a book that includes some of the finest mechanical presses built today . . . the Warco line of Eccentric Gear Presses.

Heavy duty with lower maintenance and longer life, greater precision, and increased operating safety is the aim of Warco press builders, in their line of Eccentric Gear Presses.

Warco Eccentric Gear Presses incorporate barrel-type adjustment, all-steel gears with heat-treated alloy steel pinions and steel pitmans fitted with heavy-walled bronze eccentric and saddle bushings. Extra flywheel energy is supplied to insure adequate long-draw capacity. All-Warco Presses are equipped with Warco's popular Pneumatic Friction Clutch and Brake, and other features interesting to press users . . . features that contribute to longer press life, greater operator safety, increased production and precision are included in the Warco Eccentric Gear Press design.

The new Warco Eccentric Gear bulletin shows above features in detail

Federal® WELDERS

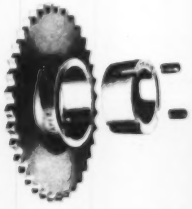
Warco PRESSES®

THE FEDERAL MACHINE & WELDER COMPANY

WARREN, OHIO

NEW PRODUCTS and equipment

application to sprockets of the firm's Taper-Lock principle. Result is elimination of sprocket reboring to fit shafts. Neither is it necessary that shafts be turned and ground to get a tight fit. Sprocket is keyed to the shaft, gripping it with firmness of a



shrunk-on fit. But, when a sprocket must be replaced, it comes off easily and the bushing can be reused.

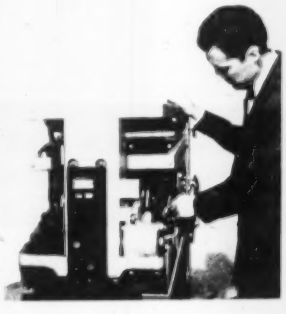
Sprockets are compact, without flange or protruding parts, and will take any make of American standard chain. Dodge Mfg. Corp., Dept. ST, Mishawaka, Ind.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Low-Voltage Switchgear Line

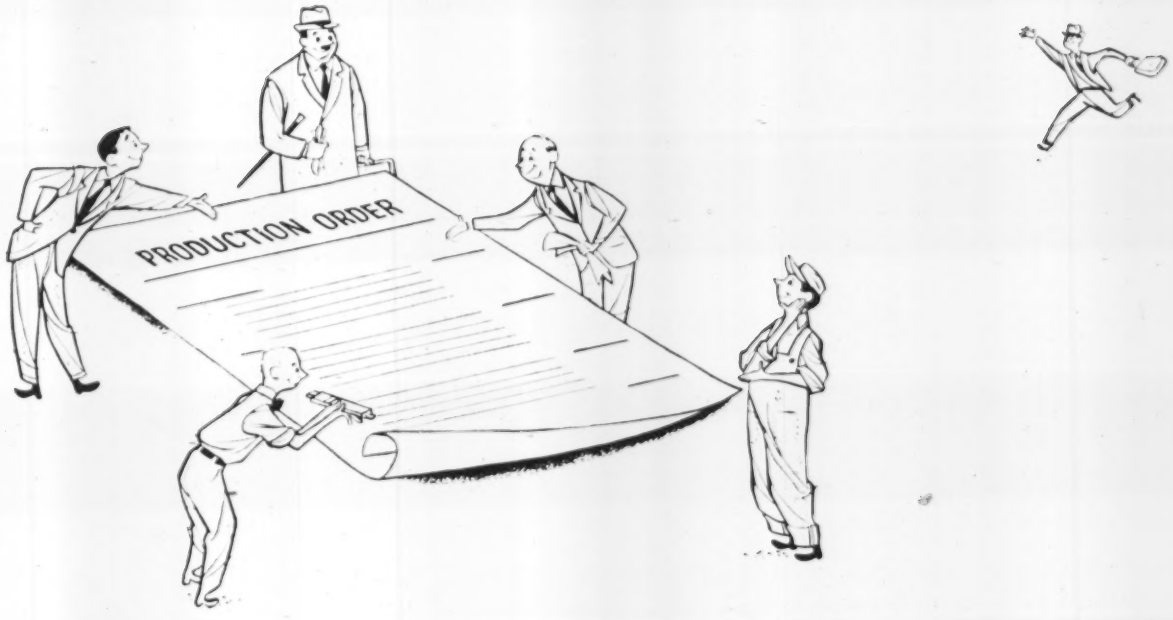
. . . 600-v ac and below

Complete line of low-voltage drawout switchgear—600-v ac and below—makes available standardized compartment construction and new air circuit breakers. Complete



equipment, with whatever circuit breaker is needed, can be made from standardized circuit breaker, control-instrument and bus compartment building blocks.

Air circuit breakers can withstand 30-cycle momentary currents equal to their interrupting ratings of 15,000 to 100,000 amp. This makes it possible to have fully selective tripping with all breakers applied up to their full interrupt-



Everybody gets into the act . . .

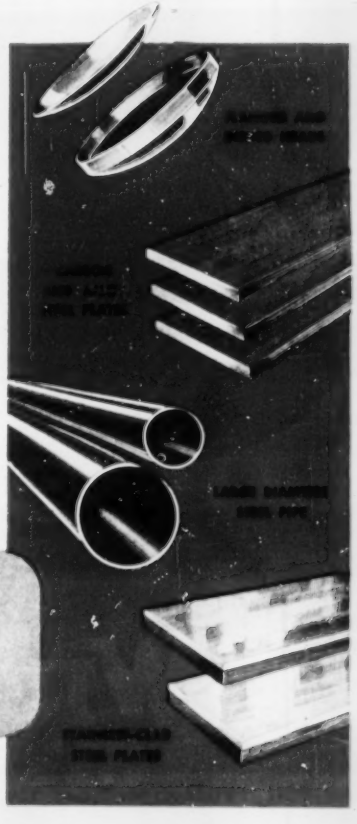
That's the way we want it to be, here at Claymont.

Because that's the way we make sure that your order for alloy steel gets careful, individualized supervision . . . painstaking attention to every processing detail right from the front office, through our laboratories, down to the men who roll your steel.

Let us show you how our *personal touch* assures you of alloy steels that are truly tailored to your specialized requirements.

Write or call Claymont Steel Products Department, Wickwire Spencer Steel Division, Claymont, Delaware.

THE COLORADO FUEL AND IRON CORPORATION—Denver, Colorado
THE CALIFORNIA WIRE CLOTH CORPORATION—Oakland, California
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New York • Philadelphia
CANADIAN OFFICES: Toronto • Winnipeg • Edmonton • Vancouver



CLAYMONT STEEL PRODUCTS

PRODUCTS OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

CF&I

YOU'RE SAFE WITH THE

NEW SUPER-TOUGH

WILLSON SAFETY HAT

THE NEW WILLSON SAFETY HAT is entirely new in design, material and method of manufacture . . . tough as metal and more resilient! Here are some other outstanding features of the new Willson Super-Tough* Safety Hat . . .

streamlined contour—deflects objects more effectively and provides a greater safety "pocket" inside.

new suspension design—adjustable "hammock" headband is suspended *inside* at 6 points. No exposed rivets or lacing—no holes through hat.

comfortably cool—space between headband and shell provides ample air circulation for wearer.

moisture resistant—practically 100% waterproof and resists many caustics and acids.

Passes all required tests with an extra margin of safety!

Write for your copy of the new bulletin describing the Willson Super-Tough* Safety Hat.

*trademark

More than 300 Safety Products Carry This Famous Trademark

WILLSON®

Established 1870

WILLSON PRODUCTS, INC., 233 Washington Street, READING, PA.

NEW PRODUCTS and equipment

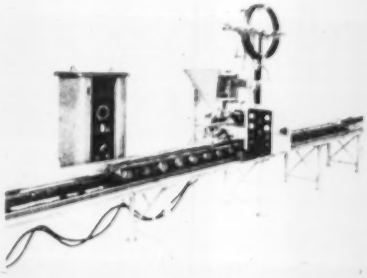
ing ratings. Continuous current ratings range from 15 to 4000 amp. General Electric Co., Dept. ST, Schenectady 5, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Automatic Welder, Positioner

. . . rapid, nonmanual operation

Automatic welder and positioner is an addition to the Sight Feed line, for use in fabrication and for repair of equipment by electric welding. Features include provision for low and high voltage welding, high frequency starting and



stabilization. Welding can be lineal or cross-bead on flat or circular shapes, continuous or in sequence.

Rotating spindle is adjustable vertically to accommodate a large work size range. Angular positioning for welding idler and roller flanges, crusher mandrils and similar applications is done by hydraulically controlled elevating device. Sight Feed Generator Co., Dept. ST, W. Alexandria, O.

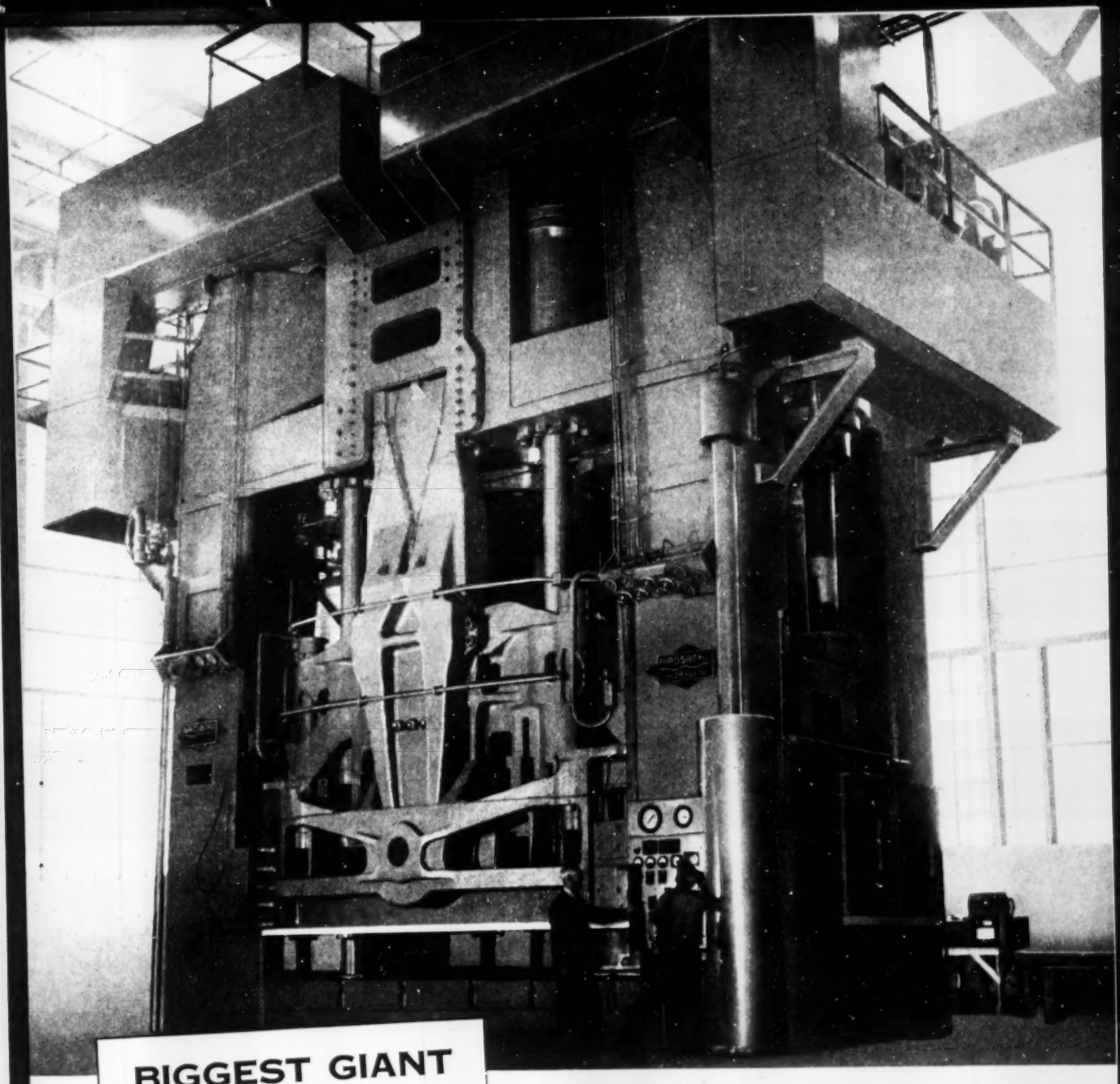
FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Copper-Clad Hardenable Steel

. . . low-cost conductive parts

Copper-clad steel is a composite metal consisting of a layer of medium carbon steel with a relatively thin layer of electrolytic copper clad to one or both sides. Called Conflex, it is a highly conductive spring material providing excellent ductility for extreme forming and retaining good spring properties after heat treatment. Primary advantage is relatively low cost.

Flexibility in electrical conductive properties is gained by varying copper layer thickness. With a 10-80-10 thickness ratio, the product has a conductivity of about



BIGGEST GIANT OF THEM ALL!

• This new 8,000-ton hydraulic press, designed and built by BIRDSBORO, is located at Lockheed Aircraft Corporation's factory in Burbank, California. It is the largest of its kind in the world. With a total height of 48 feet, of which 12 feet is foundation imbedded in the floor, this huge machine enables Lockheed to produce larger individual parts with heavier sections of new, tougher metals demanded by tomorrow's high speed aircraft. The operator of this giant press controls a force equivalent to the weight of a battle cruiser as he forms components of tough aluminum alloy a half-inch thick and up to ten by 30 feet in size. The giant press is part of Lockheed's five-million dollar expansion program.

designed & built by **BIRDSBORO**

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA.

HYDRAULIC PRESSES

HPE 1-53

Offices in Birdsboro, Pa. and Pittsburgh, Pa.

• ***designers and builders of:*** Hydraulic Presses • Steel Mill Machinery • Crushing Machinery • Rolls • Special Machinery • Steel Castings

30 per cent when compared with solid copper. General Plate Division, Metal & Controls Corp., Dept. ST, Attleboro, Mass.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Braided Sling

. . . has reuseable fitting

An eight-part braided sling features a thimble fitting known as Pin-Lock thimble. It is attached by pins and is readily removable for reuse. A. Leschen & Sons Rope Co., Dept. ST, 5909 Kennerly Ave., St. Louis 12, Mo.

FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Adjustable Wrench

. . . for inserting valves

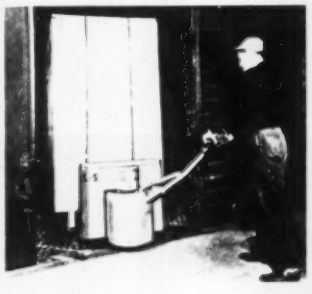
Designed for insertion of valves in cylinders, this adjustable valving wrench is constructed of tough steel alloy case hardened. The handle can be fitted with either of two jaws: One adjustable from 15/16-inch to 1 3/16 inches; the other from 1 3/16 to 1 7/16 inches. A 1-inch steel pipe extension attached to wrench governs amount of torque applied. Superior Valve & Fittings Co., Dept. ST, Pittsburgh, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Low-Lift Walkie Truck

. . . more power, less space

Short headroom and 6000-pounds handling capacity are two factors that make this JackLift truck applicable for operations where ramps must be navigated. Redesigned to become more compact for work



in confined areas, its increased power is gained by use of a compound-wound General Electric traction motor. It has two speeds forward and reverse and all controls are in the handle head.

The motor has continuous 1¼-hp rating with overload capacity of more than twice this figure. All operating parts are placed where they are easy to service; there are no under-truck adjustments. Lewis-Shepard Products Inc., Dept. ST, Watertown, Mass.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

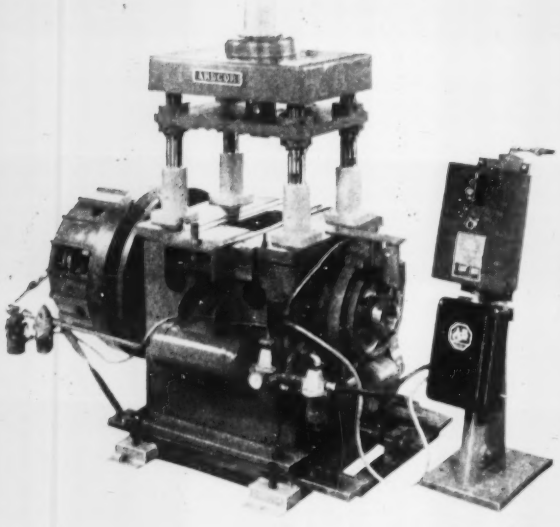
Barrier-Type Safety Guard

. . . protection regardless of die

Maximum operator safety regardless of die used and without sacrificing press efficiency is the function of this barrier-type punch press guard. Simple, flexible design provides for dropping vertical rods through any pair of prelocated holes in horizontal guard plates to set up a protective cage around the die area. Number of rods depends on size of bolster plate.

Virtually any shaped contour can be formed by varying rod

ARDCOR Engineered
MEANS BETTER COLD-ROLL FORMING



35 TON PRESS EQUIPPED WITH AIR CLUTCH AND AIR RELEASE SPRING-SET BRAKE

A complete package press that offers a high degree of dependability and accessibility. Available as either a "flying cutoff" or high speed dieing machine. Up to 700 strokes per minute. Write for details.

American ROLLER DIE CORPORATION
20700 St. Clair Avenue · Cleveland 17, Ohio

STRETCH OUT YOUR STAINLESS, TOO

There *are* ways to stretch out your supply of stainless.

For example, you may be using a grade or finish of stainless that is in extreme demand when another similar one, not as tight, could do the job adequately.

Our metallurgical staff and stainless fabricating specialists are ready to help you look into this matter and to advise you on more readily-available types of stainless that will do a satisfactory job. Feel free to call on us for this specialized help.

CRUCIBLE first name in special purpose steels

53 years of Fine steelmaking

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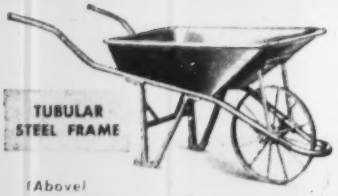
REZISTAL STAINLESS • REX HIGH SPEED • TOOL • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS

SELECT A Sterling THAT FITS YOUR JOB!



TUBULAR STEEL FRAME

(Above)
Model D3½S Maximum Capacity 3½ cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Steel channel legs V shaped front braces and brace support.

(Right)
Model C5W Maximum Capacity 5 cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Heavy duty malleable wheel guard.

12 SPOKE STEEL WHEEL

PNEUMATIC TIRED WHEEL

IMMEDIATE SHIPMENT

There's a Sterling Barrow for every type of hauling job, whether it's dry, bulky materials like sawdust or heavy industrial loads like castings or steel parts. Also special barrows for brick, tile, coal, concrete block and similar materials. All barrows are scientifically designed, well balanced and sturdily constructed for a long service life. Choice of wood handles or tubular steel frame, steel wheels or pneumatics. Write for new Sterling Wheelbarrow Catalog No. 61.

WOOD HANDLE BARROW

DEALERS: Want to sell quality wheelbarrows? You can on our non-exclusive basis. Write for details.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

A 5714-35 R2

Why Lift Extra Tonnage?

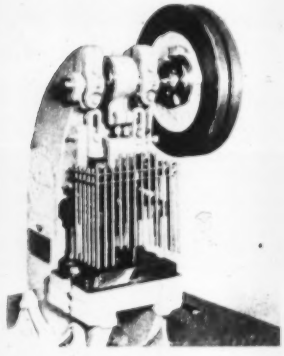
Walker Lifting Magnet operates with valuable saving of electrical energy . . . high ratio lifting magnet gives maximum lifting with minimum weight. Walker's advanced design insures more payload per lift . . . gets into corners . . . reduces supplementary hand work.

LESS WEIGHT MORE POWER!

O. S. WALKER CO. Inc.
WORCESTER 6, MASSACHUSETTS

NEW PRODUCTS and equipment

height and position in the guard plates. Rods are held at desired heights by small clips. To change the pattern for a new die requires



only seconds. Guard openings can be arranged to permit parts insertion or ejection from the die. Benchmaster Mfg. Co., Dept. ST, 1835 W. Rosecrans Ave., Gardena, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Electric Fork Lift Line

. . . 1000-4000 pound class

Duolift rams with leakage return and class H silicone insulated motors are two features available in a line of electric fork lift trucks covering the 1000 to 4000-pound load class. Hydraulic safety fuses and good maintenance accessibility are

other design elements incorporated. Benefits include maximum protection against damage from overheating, protection of ram plunger, low maintenance cost and assurance of locked load position if line ruptures.

All models are offered with either the Duolift rams, providing full free lift, or monolift, which

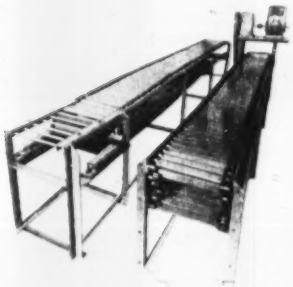
permits 19¼-inch free lift before overall height begins to increase. All models have full telescopic lift height of 132 inches. Automatic Transportation Co., Dept. ST, 149 W. 87th St., Chicago 20, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Pusher-Type Slat Conveyor

. . . handles hot bulky products

Hot billets and similar heavy, bulky products can be handled effectively on this power-driven pusher-type slat conveyor. Conveyed material is pushed by bars that are clamped to a pair of power-driven chains which travels in the side rails of the conveyor



frame. These bars, located at 48-inch centers, push the material over a stationary, full-width roller bed.

Both roller ends are equipped with lubricated bearings that roll in a case-hardened raceway. The entire ball-bearing housing is pushed into the end of the roller and held in position by a spring lock that provides quick and easy assembly. Sage Equipment Co., Dept. ST, 31 Essex St., Buffalo, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Tube End Reducer

. . . connects smaller size tube

This tube end reducer is used to convert any Ferulok fitting into a combination size unit, permitting connection of a smaller size tube. It is inserted into the tube connection end of the regular fitting and attached with the nut and ferrule of that fitting. The other end of reducer is coupled to smaller size tubing with reducer's

Sure Fire Killer!
"Automatic" SPRAY Sprinkler
UL LISTED AND FM APPROVED
YOU should specify "Automatic" SPRAY Sprinklers for your new building now in the planning stage or an old one, soon to be renovated. For here is a completely new fire fighting device that provides far superior protection than can conventional approved sprinklers. They're recognized as preferred for installation in all types of occupancies . . . both concealed and exposed piping systems. Yet, "Automatic" SPRAY Sprinklers cost no more than old style heads.
Ask any fire insurance underwriter about "Automatic" SPRAY Sprinklers, the "sure fire killer." He knows the facts of fire and what's needed for maximum safety.
You can afford no less than the best. Get "Automatic" Sprinkler . . . . FIRST IN FIRE PROTECTION.
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Offices in principal cities of North and South America
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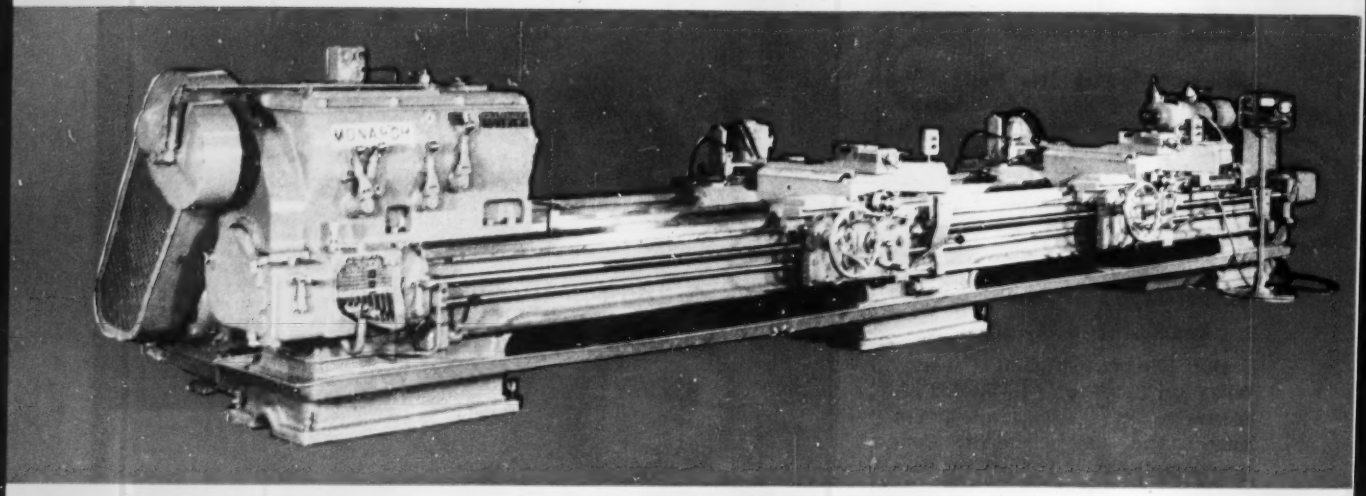
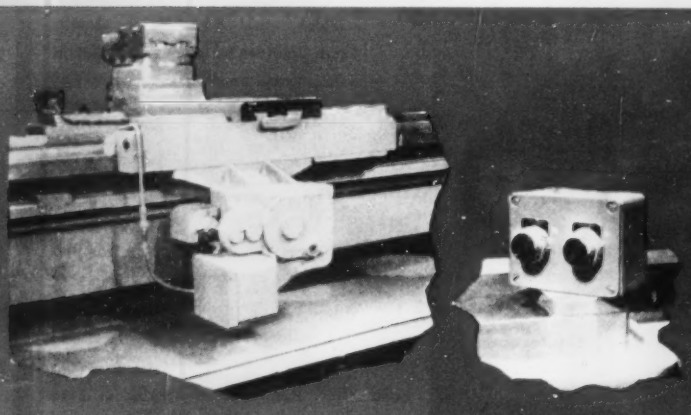
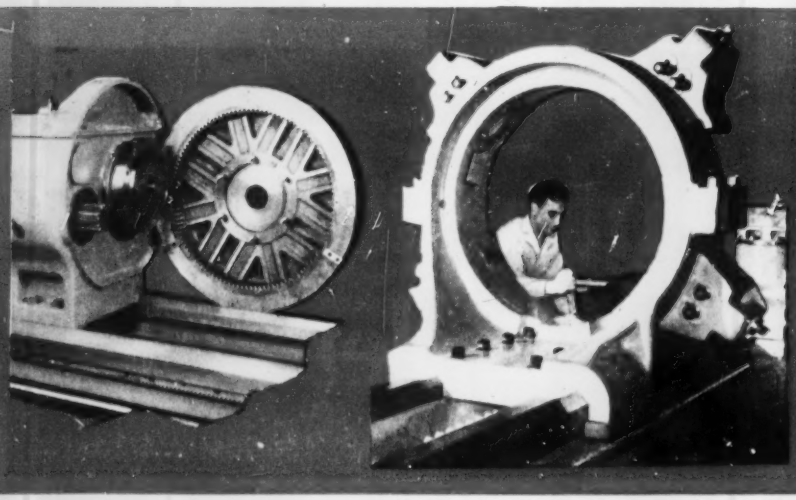
CORPORATION OF AMERICA · YOUNGSTOWN, OHIO





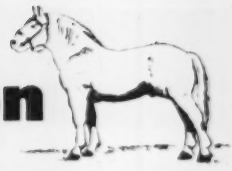
PLUS CONTROL. A smoothly functioning rapid traverse in either direction is furnished by unit mounted at rear of machine (left). Push button controls on front carriage wing (right) give instant response only when depressed. Standard on 25" Model N and 32" Model NN, optional on 20" Model M.



PLUS POWER. For heavy stock removal from large diameter work, the optional face plate drive headstock is a "must" (left). It insures full, even delivery of power under load. Drive may also be taken through spindle. Steady rests of great capacity and strength are provided. This one (right) will take work 36" to 38½" diameter.

Monarch 25" Model N with long bed. Note optional dual carriages—ideal for peak production on long shafts and gun barrels. Perfect performance is noted with two tools turning simultaneously. Air-Gage Tracer Controls can be supplied for both carriages (as shown), either carriage, or neither. Monarch-Keller controls can also be furnished.

BIG Monarchs



Powered like a Percheron

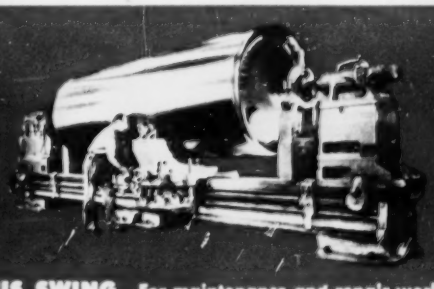
Nimble as a Pony

Imagine a great steel-muscled Percheron with the instant, spirited responsiveness of a polo-pony—and you've got a picture of the Monarch Heavy Duty Lathes. Here are lathes with the size, power and rigidity to hog off heavy cuts from big work—yet built to provide high finish, close accuracy and convenience of operation! Witness the great number of them—both with and without Air-Gage Tracer controls—speeding production of critical jet aircraft parts today.

Here's unequaled strength and versatility within the capacities offered—20", 25" and 32" swings in standard lengths up to 324" between centers. Look at the special features and applications we've found room to illustrate here. Then write for our Booklet z1208—36 pages of data and pictures—for the complete Monarch Heavy Duty Lathe story. We'll send it gladly . . . . *The Monarch Machine Tool Company, Sidney, Ohio.*

FOR A GOOD TURN FASTER . . . TURN TO MONARCH

Monarch
ACCURACY • ECONOMY • LONG LIFE
TURNING MACHINES



PLUS SWING. For maintenance and repair work—for occasional big parts, light cuts on big diameters, and turning shafts with previously machined large sections, plus swing up to 60" and more can be provided. This Model SN, shown turning a paper machine drum, swings 84"

nut and ferrule. Parker Appliance Co., Dept. ST, 17325 Euclid Ave., Cleveland 12, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 15

Elapsed Time Indicators

. . . small in size

Running time indicator series ET-1 for industrial or laboratory application is made in two models: ET-1A counts to 99,999 hours by hours, ET-1B counts to 9,999.9 by tenths of hours. Series utilizes Bristol Circle B motor. Device is 2 inches in diameter and 2⅛ inches in depth. It operates on 115 v, 60 cycles. Vocaline Co. of America Inc., Dept. ST, Old Saybrook, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Prong Type Tool

. . . attach, detach link belting

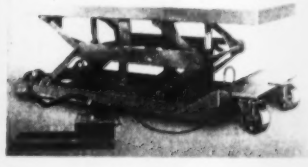
Brammertool is a prong type tool used to attach and detach V link belting. A light pressure inserts ends of prongs into standard slots of V links. Another twist opens the slots so that rivet heads can be quickly slipped in or out to make or break connections in belting. Brammer Corp., Dept. ST, 684 Broadway, New York 12, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Portable Sheet-Feeding Table

. . capacity: 3 to 10 tons

Heavy sheets can be fed to presses, brakes or shears by this double ram sheet feeding table, within its 3 to 10-ton load capacity. Although a heavy-duty unit, the table



has swivel casters and smooth-rolling wheels to gain maximum portability in storage loading areas and between machines.

Table has a 36 x 96-inch top to provide easy handling of large sheets. It is hydraulically-operated by multiple-speed foot pump and is also furnished with electric drives. Rack Hydraulic Equipment Corp., Dept. ST, Connellsville, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

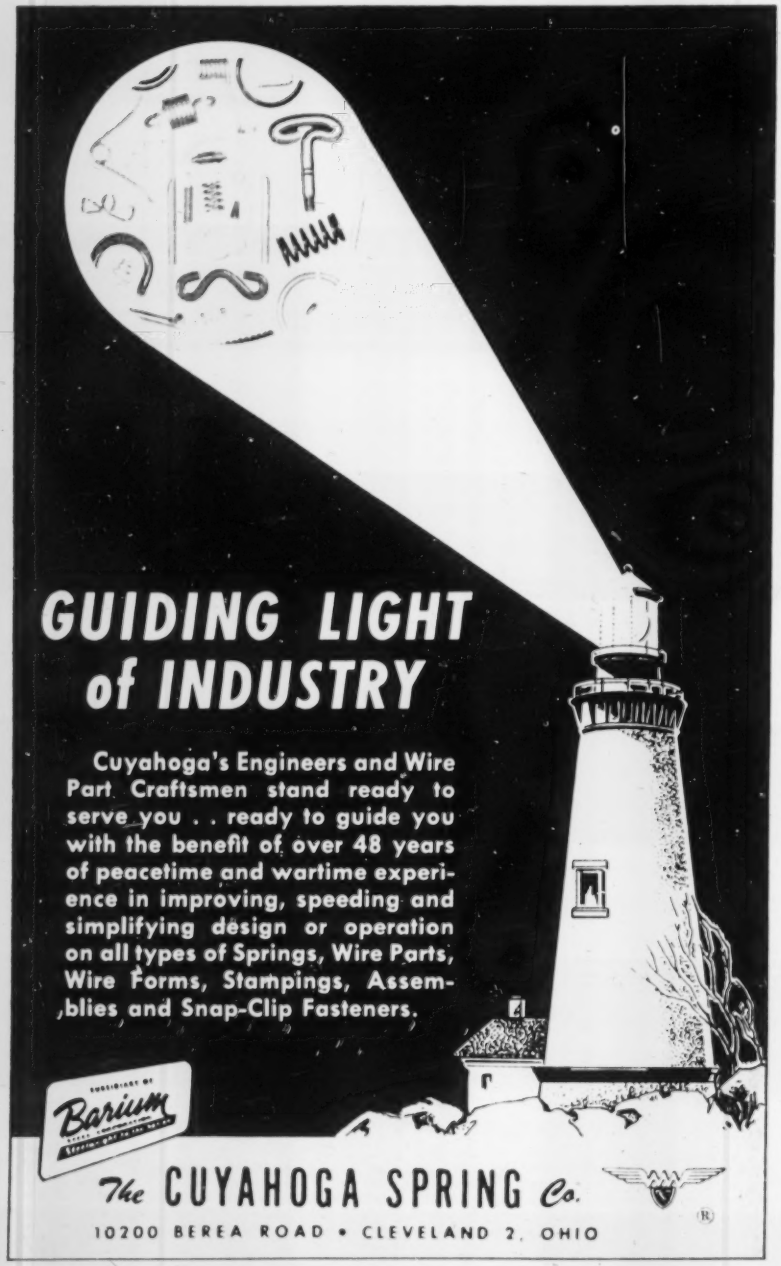
Fractional hp Magnetic Brakes

. . . self-adjust for wear

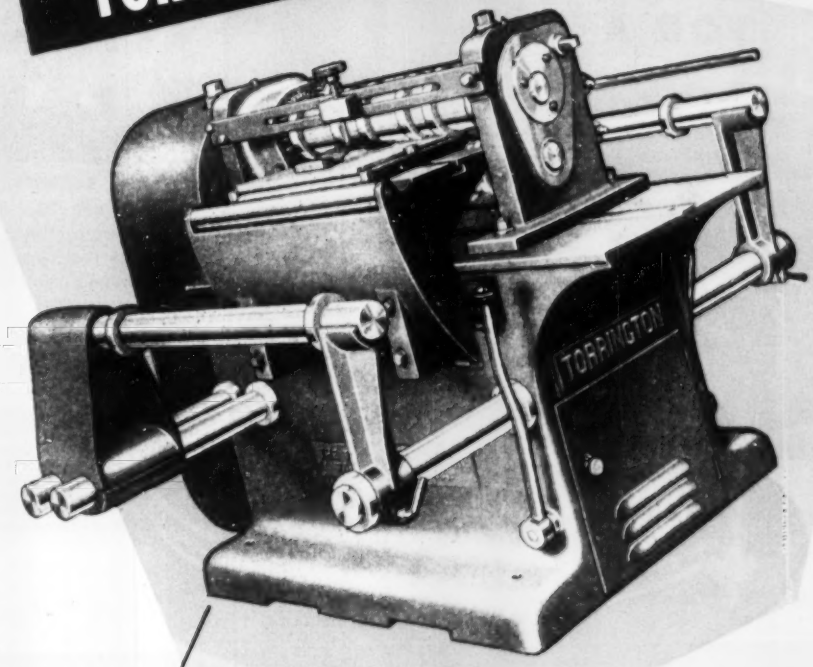
Fractional horsepower magnetic brakes for all standard alternating or direct current motors are available with torque ratings of 1½, 3 and 5 pound-feet. Brakes self-adjust for wear, but critical torque

adjustment can be made for precisely timed stops. Units have thermal ratings of 6, 7 and 8 hp seconds per minute, respectively.

Molded asbestos friction disks


GUIDING LIGHT
of INDUSTRY
Cuyahoga's Engineers and Wire Part Craftsmen stand ready to serve you . . ready to guide you with the benefit of over 48 years of peacetime and wartime experience in improving, speeding and simplifying design or operation on all types of Springs, Wire Parts, Wire Forms, Stampings, Assemblies and Snap-Clip Fasteners.
Barium
The CUYAHOGA SPRING Co.
10200 BEREA ROAD • CLEVELAND 2, OHIO

TORRINGTON SLITTING MACHINES...



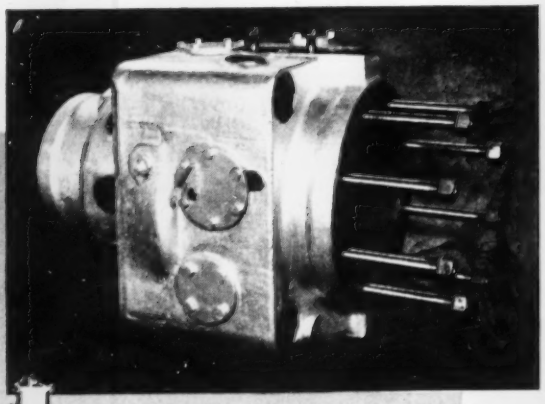
FAMOUS FOR YEARS OF CONTINUOUS, DEPENDABLE SERVICE

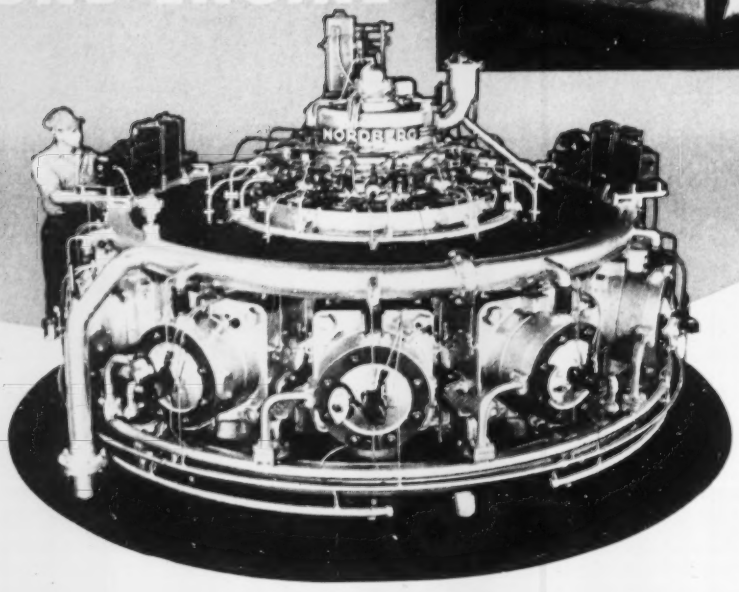
These compact, easily operated machines are especially designed to meet the needs of sheet metal fabricators who require slitters that can be quickly set up to produce any desired combination of cuts on any gauge of metal within their range. The product of years of research, development and experience, Torrington Standard Slitters are famous for continuous, dependable service.

THE TORRINGTON MANUFACTURING COMPANY

TORRINGTON, CONNECTICUT

Square Cylinder FOR A ROUND ENGINE





another "difficult" casting made easier with CHATEAUGAY PIG IRON

● It's one of eleven cylinders on the 1650-HP Nordberg Radial Diesel shown above. And because it's a one-piece casting, complete with built-in water jacket, adjoining light and heavy sections are encountered. Thanks to CHATEAUGAY Pig Iron, however, there are no problems of partially-filled molds or uneven cooling.

CHATEAUGAY—Republic's *exclusive* premium pig that outperforms all other irons—imparts exceptional fluidity to any mix in which it is used. It fills every section of the mold . . . cools uniformly . . . provides a uniform grain structure that machines readily and economically.

A Republic Pig Iron Metallurgist will be glad to give you the complete story about low phosphorus, copper-free CHATEAUGAY Pig Iron . . . show you how and where it should be used for most effective, profitable results. Write today to:

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

Republic PIG IRON

"CHATEAUGAY" Low-Phosphorus, Copper-Free
"REPUBLIC" (Northern) Foundry, Basic and Malleable
"PIONEER" (Southern) Foundry and Basic

REPUBLIC STEEL

with high heat dissipation keep operation cool. Design eliminates solenoids and mechanical linkage. Standard brakes are fully enclosed and weatherproof; explosionproof covers are available. Dings Brakes Inc., Dept. ST, 4740 W. Electric Ave., Milwaukee, Wis.

FOR MORE DATA—CIRCLE REPLY CARD NO. 19

Heat Treat Furnace Loader

. . . feeds metered quantities

This heat treat furnace loader automatically removes material from a hopper and discharges it in even and metered quantities into an endless belt-type heat treat furnace. A series of synchronized

vertical-moving pushers, cut on a 30-degree angle, removes parts from the hopper, raises them to the next level and causes them to roll off by force of gravity.

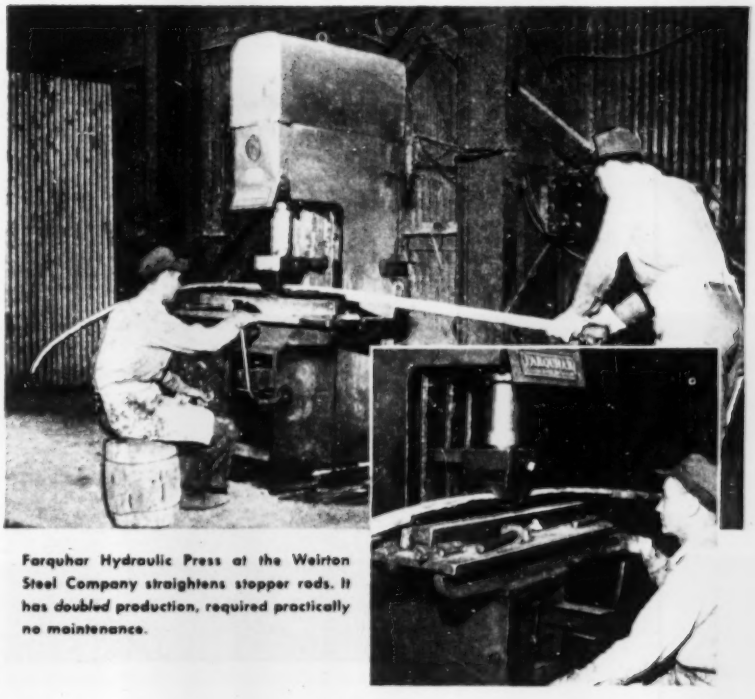
With this equipment, one man can load from 500 to 4000 pounds per hour of small stampings, forgings or castings to full furnace capacity for an indefinite run. One effect of the Man-O-Steel installation is to eliminate one or more workers, reducing production cost and minimizing the human element in furnace heating. Michigan Crane & Conveyor Co., Dept. ST, 115 N. McKinstry Ave., Detroit 9, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 20

Lighting Combinations

. . . for lift truck, tractors

A selection of lighting combinations for the manufacturer's fork lift trucks and tractors is available optionally as original equipment. Floodlights, tail lights, and stop lights are made in varied arrangements to meet individual requirements. Single switch or



Farquhar Hydraulic Press at the Weirton Steel Company straightens stopper rods. It has *doubled* production, required practically no maintenance.

Farquhar Hydraulic Press

at the Weirton Steel Co.

"eliminates breakage of rods... increases production 100%"

The Weirton Steel Co., Weirton, W. Va., formerly straightened stopper rods with a steam hammer. The operation was slow and resulted in a high percentage of breakage. Seeking a better method, Weirton officials bought a Farquhar Press to speed production. Not only has the press increased production 100%, but it has eliminated breakage of rods. In addition, Weirton reports that in the six years this press has been operating, "practically no maintenance has been necessary."

Farquhar Presses Cut Your Costs

Just one more example of cost-cutting Farquhar performance in modern production! Farquhar Presses are built for the job . . . assure faster production due to rapid advance and return of the ram . . . greater accuracy because of the extra guides on the moving platen . . . easy, smooth operation with finger tip controls . . . longer life due to positive control of speed and pressure on the die . . . long, dependable service with minimum maintenance cost.

Farquhar engineers are ready to help solve whatever production problem you may have. Send for free catalog showing Farquhar Built-for-the-Job Presses in all sizes and capacities. Write to THE OLIVER CORPORATION, A. B. Farquhar Division, *Hydraulic Press Dept.*, 1522 Duke St., York, Pennsylvania.

Farquhar

HYDRAULIC PRESSES

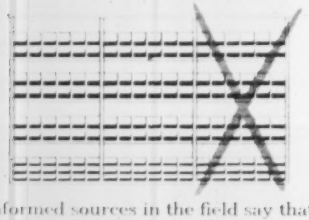
for Bending • Forming • Forging • Straightening • Assembling • Drawing Extruding • Jogging • Forging • and other Manufacturing Operations

THE OLIVER CORPORATION, A. B. FARQUHAR Division

NEWS ABOUT CREATED-METALS

Are Industry Inventories too High?

Business Week recently stated, "Don't underestimate the inventory problem. If a recession starts anytime in 1953, stocks of goods are likely to be at the bottom of it." *Iron Age* pointed out that, "hottest subject in automotive circles today is reducing tooling costs and shortening the tooling time cycle."

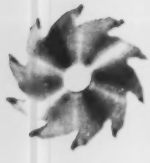


Informed sources in the field say that the Carboloy Minimum Tool Inventory Plan (described on these pages) is a forward step in answer to these problems as far as cutting tools are concerned.

* * *

Woodcutting Saws to Get New Teeth

The Carboloy organization has recently standardized production on 20 solid tungsten carbide tips for circular woodcutting saws. Saws with these carbide tips will soon be available from a number of saw manufacturers and offer phenomenal production increases over steel blades. Tool manufacturers can obtain details and prices by writing for Bulletin W.W.-53-1, Carboloy Department of General Electric Company (address at right).



* * *

Communications Given Boost by Magnets

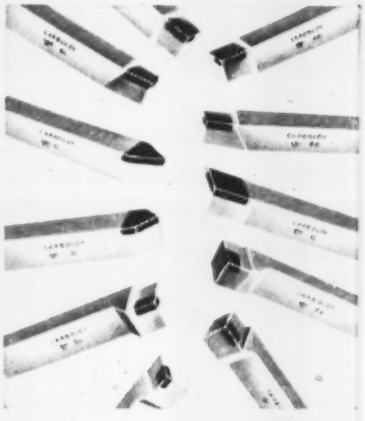
Because they help eliminate costly, bulky coils, Carboloy permanent magnets are being used more and more in communications equipment. The list includes loudspeakers for shops, radio, TV . . . other electrical components in telephones, transmitters, phonographs, hearing aids, etc.

These are the same Carboloy permanent magnets shop men find so useful for separating sheet steel, retrieving tools, holding jigs and doing other handy, timesaving jobs.

YOUR CARBOLOY SALES REPRESENTATIVE SAYS . . .

"Let us show you how up to 1/3

"OUR Minimum Tool Inventory Plan is the answer. It's an easy-to-adopt plan *that works!* Under it, you stock a basic number of low-cost Standard Carboloy Tools in place of many costly "specials." The proposal shows you how to adapt these Standards to almost any single-point tooling job . . . simply and quickly. You use your regular carbide equipment. You'll cut down production delays. You'll reduce your inventories *30% or more.* Read about it on these pages . . . "



1 What are Standard Carboloy Tools?

They are high-quality carbide-tipped single-point tools for turning, boring, facing and other machining operations. They outlast high-speed steel tools as much as 10 to 1 . . . will operate at machine speeds up to 4 or 5 times faster than ordinary tools.

There are only 11 styles of Carboloy Standards. They can be used "as is," or ground—in minutes—to do up to 80% of your single-point tool machining jobs. Carboloy Standards are as near as your phone, too. They are stocked in your area by Authorized Carboloy Distributors.

2 Here's how they adapt to your jobs.

At left is a style C Standard Carboloy Tool—one of the 11 styles. Note the generous-sized carbide tip. It can be used "as is" for some jobs . . . or adapted to meet any number of your special tooling requirements (as the 5 typical, adapted shapes at left, for example).

Carboloy Standards can be ground quickly in your own tool room, using an ordinary silicon carbide wheel for the rough grind, a diamond wheel only for sharpening. With a minimum stock of Standards on your shelves, you'll be able to get up to 80% of your single-point machining jobs rolling in a hurry.

to reduce your single-point tool stocks . . . with Standard Carboloy Tools!"

3 Here's why the Minimum Tool Inventory Plan (MTIP) will work for you.

The Carboloy MTIP includes all the helps you'll need to standardize your single-point machining jobs with Carboloy Standard Tools. Send for the free MTIP kit. When it arrives: (1) Review your special single-point blueprints, using the handy plastic Instant Tool Selectors (above) to choose in seconds the right Carboloy Standard Tool to adapt for each job. (2) Enter the findings on the Plan Sheet (above, center), filling in the "...Tools Recommended" section. *That's all there is to it!* Now you can quickly compute what Standards you'll need, how many to stock, how much they'll cost. You'll see at a glance how the MTIP reduces your inventories up to one-third or more . . . lowers initial tool investment, shortens delivery cycles . . . gives you other benefits shopwide.

4 A Carboloy Sales Representative or Distributor will make sure it works.

Before you adopt this plan you can, if you wish, have a carbide expert from the Carboloy factory, district office or nearby Carboloy distributor come to your plant . . . help you get the MTIP rolling. He knows what carbide grades to recommend for particular jobs. He'll show you how Standard Carboloy Tools can pay for themselves in increased production and downtime savings alone. His services cost you nothing.

Carboloy Tools Are Stocked Coast To Coast By

AUTHORIZED CARBOLOY CEMENTED CARBIDE DISTRIBUTORS

Look under "Tools" in the Yellow Pages of your local telephone book, or in Thomas' Register, for your nearby Carboloy distributor. He has complete local stocks and can give you complete carbide service.

"Carboloy" is the registered trademark of the Carboloy Department of General Electric Company.

GET ALL THE FACTS. MAIL COUPON TODAY!

CARBOLOY

DEPARTMENT OF GENERAL ELECTRIC COMPANY

11141 E. 8 Mile Road, Detroit 32, Michigan

☐ Please rush me, at no cost or obligation, full details on your Minimum Tool Inventory Plan.

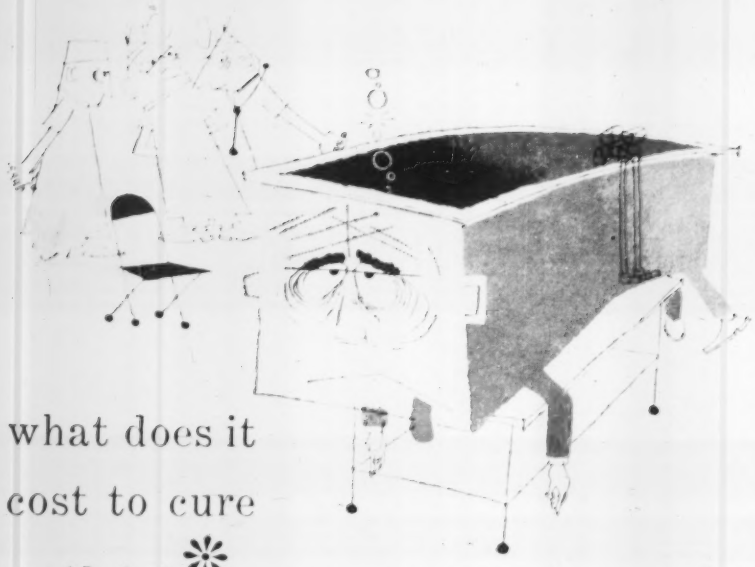
☐ Have your representative call, without obligation.

Name Position

Company

Address

City Zone State



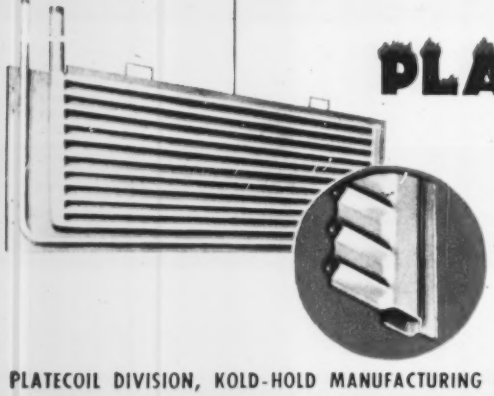
what does it
cost to cure
coil-itis* in your processing tank?

The constant care it takes to keep tanks operating when they're plagued with coil-itis is extremely costly. Downtime, and all the other maintenance time, slow heating and cooling ills of using old-fashioned pipe coils can be cured with Platecoils. As revolutionary as the new wonder drugs, Platecoils save as much as 50% in initial cost. They take 50% less space in the tank. They simplify maintenance and save hours of downtime. Compared to the hours it takes to clean and replace pipe coils, Platecoils can be cleaned and replaced in no time at all . . . without dumping the solution. It costs less to cure coil-itis with Platecoils than to suffer its evils. **Write for bulletin P72 today!**

PLATECOILS SAVE 50% IN HEAT TRANSFER COSTS

PLATECOILS COST LESS TO BUY, INSTALL, MAINTAIN

The Newcomb-Detroit Co., Grand Rapids Division, has found it is less costly to buy, install and maintain Platecoils than to fabricate pipe coils in their own plant. Ask about other case histories.



PLATECOIL
REPLACES PIPE COILS

*Coil-ifis — Diagnosed as tank heating and cooling problems. Platecoils — the prescription for solving pipe coil problems.

PLATECOIL DIVISION, KOLD-HOLD MANUFACTURING CO., LANSING 4, MICHIGAN

NEW PRODUCTS and equipment

multi-switch controls can be furnished as well as a red stop light operated from the brake pedal. Towmotor Corp., Dept. ST, 1226 E. 152nd St., Cleveland 10, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 21

Intraplant Personnel Vehicle

. . . service and supervisory jobs

Fast intraplant transportation for maintenance and servicemen, watchmen or other personnel is accomplished by this gasoline-powered vehicle. Called the Jobster,

it is all hand-controlled, with automatic drive, friction reverse and quick-action brakes. A large trunk in the rear provides ample space for light equipment or goods.

The 2½-hp engine develops speeds to 25 mph, averaging 80 to 100 miles per gallon of gasoline. Hatfield Engineering Co., Dept. ST, 1300 N. Bristol St., Elkhart, Ind.

FOR MORE DATA—CIRCLE REPLY CARD NO. 22

Pipe Line Filters

. . . for 40 psi maximum pressure

Four small pipe line filter models are available for installations requiring only 40 psi maximum pressure for compressed air or gas. They feature one-bolt accessibility for quick inspection and cleaning without removing filters from the line.

The filters are made in two sizes and each size can use either absorption pad media or company's

USE A REPLY CARD
Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

69. Small Hole Tappers

Hamilton Tool Co. Super-sensitive tapping machine described and illustrated in 4-page bulletin T-47 has capacity from smallest and finest tap to 10-32, round table to chuck clearance of 4 in. and vertical travel of table of 1¾ in. Specifications and other data are included.

70. Clamps & Fixtures

Lodding Inc. 58-pages of dimensional drawings as well as specifications are presented in catalog on "Clamp Assemblies and Fixture Details." All components necessary to standardizing tool engineering practice are grouped for users' convenience. Items cataloged include washers, nuts, bolts, hand cams and wheels, screws, studs, knob and lever clamps.

71. Locking Bolt

Huck Mfg. Co. Operating principle and advantages of the Lockbolt which is permanently locked in place like a rivet are contained in 4-page illustrated folder and supplementary bulletins. Cross-sectional and dimensional drawings and application data are included.

72. Stainless Steel Pipe

Carpenter Steel Co. "How you can get more stainless steel pipe for your money" is theme of 6-page folder which deals with advantages offered by schedule 5 stainless steel pipe. Lighter walled and having large inside diameter for same outside diameter, this pipe weighs and costs less than equivalent size schedule 40 pipe. Technical data are summarized.

73. Brass-Bronze-Copper

Chase Brass & Copper Co. Do you want an informative manual on free-cutting brass, bronze and copper? Then send for 64-page manual D-7 which gives properties and application data on wrought copper alloys which are available in wire, rod, bar, strip, plate, tubular and rolled forms. Covered also are such subjects as tools, speeds, feeds and lubricants to be employed in machining these metals.

74. Automatic Press

Morey Machinery Co. Details of the Raskin Velox type high speed automatic press for stamping and piercing sheet metal from coil stocks are presented in 4-page illustrated bulletin. Four models have capacities of 11 to 55 tons.

75. Braided Wire Slings

Union Wire Rope Corp. Dimension, weights and safe loads for various types of Tuffy braided wire fabric slings and fittings are tabulated in 48-page handbook. Step-by-step splicing is also described and illustrated, as well as directions for attaching sockets or socketing a ferrule. Braiding is such that rope can be straightened no matter how badly kinked.

76. X-Ray Accessories

Bar-Ray Products, Inc. Photographs, specifications, descriptive data and application information for Bar-Ray line of x-ray accessories, isotope equipment, radiation protection and x-ray film processing systems are contained in 72-page illustrated catalog W-52.

77. Loading Ramps

Superior Railway Products Corp. Pictured in 4-page folder 255 are typical installations of hydraulic ramps, track-spanning bridges, street loading platforms and portable one-man operated adjustable ramps.

78. Castings

Decatur Casting Co. Facilities for producing various light gray iron and alloy iron castings are described in this 20-page brochure. Series of photographs shows castings produced for gasoline pumps and meters, electric motors, air compressors, electric starters, generators and distributors. This could be your "foundry division."

STEEL
Penton Building, Cleveland 13, Ohio

3 30-53

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COMPANY

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79. Water Softeners

Permutit Co. Trouble caused by hard water and continuous attention by curing them are described in 36-page illustrated bulletin 2486. Line of company's ion-exchange material is detailed. Differentiation between the three basic types of equipment is made and a cut-away view of an automatic unit and diagrams of systems are included.

80. Strip Handling Equipment

Frost Steel Equipment Mfg. Corp. Complete line of sheet and strip materials handling equipment as well as the newly patented stripcover and Lettvevor are described in 8-page illustrated bulletin. Equipment will handle stock with minimum of cost and delay and assures complete safety.

81. Pipe Thread Systems

Detroit Tap & Tool Co. 21-page pipe thread manual C-52 covers complete design and gaging information as well as specifications for three standard pipe thread systems. Specs for taper and straight pipe taps, thread plug and ring gages and plain plug and ring gages are included.

82. Operating a Lift Truck

Hyster Co. "How to Operate a Lift Truck" is an instructive 21-page well-illustrated manual that is instructive for both the beginner and the experienced operator. It will help old-time operators in rating their knowledge of lift truck operation. Cartoons and sketches enliven the text.

83. Vapor Degreaser

E. I. du Pont de Nemours & Co. 20-page illustrated booklet "Vapor Degreasing with Du Pont Nonflammable Solvents" tells how trichlorethylene is used for fast, thorough and economical metal cleaning. The where, how and why of vapor degreasing are discussed.

84. Steel Belt Conveyor

Pratt Conveyors, Inc. Drawings, engineering data and photographs of steel belt conveyor are found in this catalog identified as No. 250. Features of the steel belt and the Chip-A-Way conveyor using it for chip and scrap removal from machine tools and presses are covered.

85. Locknuts

Industrial Fasteners Institute. Intended to promote more effective use of locknuts, this 24-page well-illustrated brochure provides information on each of 36 types of locknuts. Each is described, its principle of operation given and range of sizes making it and plight and drawings of it are provided. Will help you as a user in selecting the locknut best suited for a particular application.

86. Metal Cleaning & Treating

Despatch Oven Co. Multistage washers, gas and steam heating systems and other equipment designed expressly for metal cleaning and treating operations are detailed in 12-page illustrated bulletin 68. Designed to process metal products efficiently, equipment can be built to fit into straight-line production, or to meet the needs of individual users.

EDITORIAL REPRINTS:

87. The Blast Furnace

Has the blast furnace become obsolete? Opinion has been expressed in a United Nations technical report that blast furnaces are on the way out as the most economical and satisfactory means for smelting iron ore. C. E. Agnew, Cleveland blast furnace consultant, offers forceful disagreement in Part I of STEEL reprint of article "Don't Write Off the Blast Furnace."

88. Nodular Iron

Spheroidal graphite or nodular cast iron is being used for large, intricately cored castings at Cooper-Bessemer Corp. Excellent castability plus high yield point to profits. Properties as well as potentialities of this relatively new iron are discussed in STEEL reprint "Nodular Iron Tackles Big Jobs."

89. Industrial Electronics

In spite of the phenomenal growth of the electronics field, the rest of industry has not shared or fully profited from its development. One reason is the economics of the situation. A. Zimmerman and T. F. Hruby, STEEL assistant editors, expound further on the subject in reprint "Industrial Electronics, A Young Giant With Growing Pains."

90. Cold Cleaning Agent

A new combination of alkali-solvent-wetting agent is effective in power washers at room temperature. It pays off particularly for light cleaning jobs with no incrusted oils. Read about this new production line cleaner in STEEL reprint "Cold Cleaner Cuts Costs" by D. C. Miner of E. F. Houghton & Co.

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NEW PRODUCTS and equipment

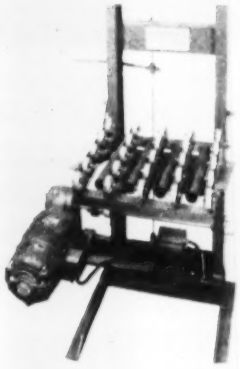
radial fin inserts. Dollinger Corp., Dept. ST, 11 Centre Park, Rochester 3, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 23

Floor-to-Floor Handler

. . . extends gravity system

Packages can be transferred from floor to floor mechanically and at minimum cost with this conveyor model handler. The conveyor plugs into a wall socket, can be built to fit flush against the wall



and has 150-pound lifting capacity.

Roller section is designed as an extension to a gravity conveyor system. Equipment is powered by a reversing motor. Steel Parts Mfg. Co., Dept. ST, 4630 W. Harrison St., Chicago, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 24

Degreasing Agent

. . . for use in tumbling mills

Cottentex, a finely ground cellulose fiber material with high absorbency is available for use in degreasing and drying operations employing tumbling mills. It is claimed to absorb more than eight times its own weight and does a thorough job of absorbing oils, grease or any liquid from metals, plastics or any type composition. Cottentex Mfg. Co., Dept. ST, 1030 E. Wells St., Milwaukee, Wis.

FOR MORE DATA—CIRCLE REPLY CARD NO. 25

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FORMING FACTS

72% SAVING IN METAL!
80% INCREASE IN PRODUCTION!
UNIQUE BALANCE CO. INC.

Typical results by every user of

NILSON 4-SLIDE

Wire and Ribbon Metal FORMING MACHINES

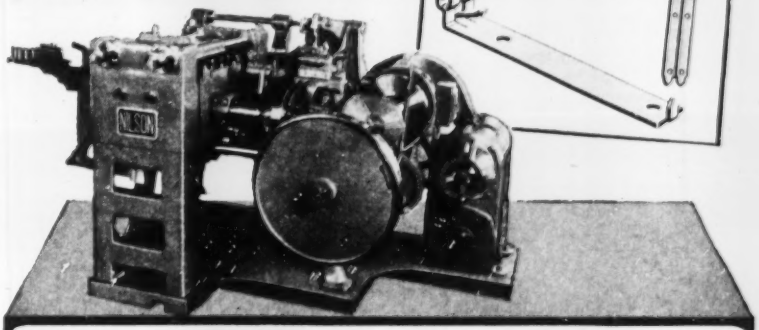
Plants from coast-to-coast are setting new production records with NILSON 4-SLIDE MACHINES . . . and experiencing tremendous economies and greatly improved quality.

Are you confronted with a keen competitive situation? Take the advice of hundreds of plant supervisors . . . install NILSON MACHINES and enjoy these economies *at once.*

NILSON combination press and 4-SLIDE forming machines take the stock directly from the coil—feed, straighten, pierce, blank, swage, stamp, coin—perform up to 5 forming operations and cut off . . . all in one quick, precise operation AUTOMATICALLY!

USING A NILSON COMBINATION PRESS AND 4-SLIDE FORMING MACHINE

Unique Balance Co., Inc. (one of the largest manufacturers of sash balance equipment), now produces 71,532 more parts out of the same amount of steel, compared to their former method. Production speeds increased from 100 to 180 pieces per minute.



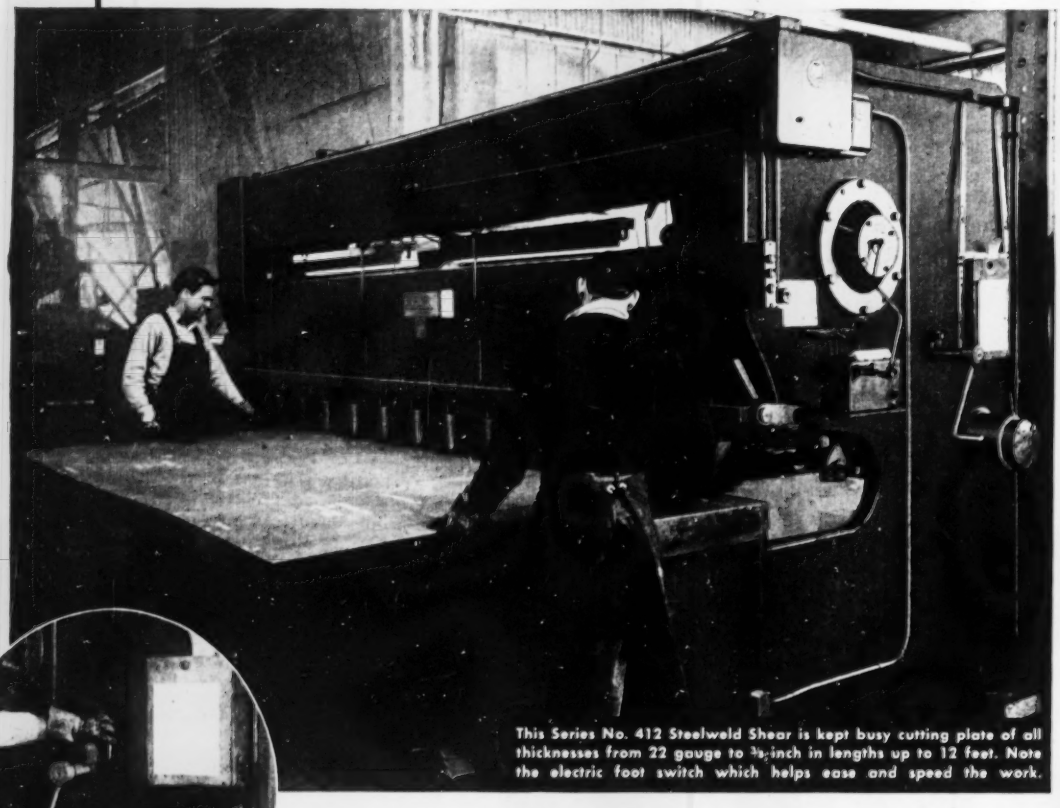
THERE'S NOTHING LIKE A NILSON

For specific recommendations, send prints or samples of your operation when requesting bulletin.

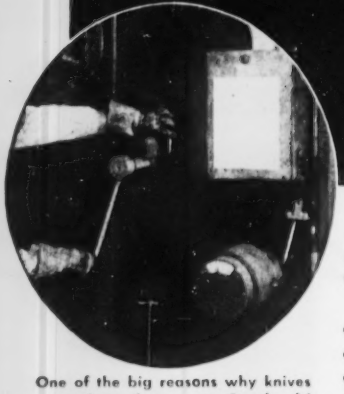
THE A. H. NILSON MACHINE CO.
1512 RAILROAD AVE. BRIDGEPORT, CONN.

Automatic Chain-Making Machines • Automatic Staple Forming Machines • Wire and Stock Reels • Foot Presses • Wire Straightening Equipment • Slide Feeds for Presses

KNIVES STAY SHARP LONGER for California Steelweld Shear User



This Series No. 412 Steelweld Shear is kept busy cutting plate of all thicknesses from 22 gauge to $\frac{3}{8}$-inch in lengths up to 12 feet. Note the electric foot switch which helps ease and speed the work.



One of the big reasons why knives stay sharp longer on Steelweld Shears is the simplicity with which knife clearance can be adjusted for every plate thickness. It's merely a matter of turning a hand crank until the gauge pointer is on the proper figure. No bolts to loosen. No need of a feeler gauge.

"It's a shame," said the shop foreman at Stephens-Adamson Mfg. Co., Los Angeles, California, "but since installing our Steelweld Shear the knife-sharpening man has been crying because we have no work for him."

After months of continuous operation, eight hours a day, usually six days a week, inspection of cut pieces indicates the knives are practically as sharp as new. Parts cut have no burrs and are straight and true. Even when the cutting edges of the knives finally become dulled, there are three more cutting edges ready for use as all four corners of each knife are prepared for shearing.

Stephens-Adamson like their Steelweld Shear and are happy over its operation. It plays an important role in the manufacture of screens, elevators and conveyors which are the principal products of this large West-coast plant. In their words, it is "heavy, well built and dependable. We know it is reliable and always ready to handle our work from day to day."

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7817 East 282nd Street • Wickliffe, Ohio

STEELWELD PIVOTED BLADE SHEARS

The Market Outlook

THE STROKE of midnight tomorrow will signal the attainment of another new record in steelmaking. The first 10-million-ton month in history.

All this month, production of steel for ingots and castings exceeded 100 per cent of capacity, and with this month being 31 days in length the industry will be able for the first time to reach a monthly total of 10 million net tons.

The high rate of operations cannot be given all the credit for the new record. The expansion of the industry's capacity is playing a big part.

PACE IS FAST—Output in the week ended Mar. 28 was at rate of 101 per cent of capacity. Yield was 2,277,000 tons of steel for ingots and castings.

How long can production continue at this torrid pace? That question is in many minds. Indications are that a busy third quarter is shaping up. Taking a long-range look ahead, Detroit Steel Corp. hazards a prediction that the steel industry can expect an over-all operating rate of at least 85 per cent during the next five years. If the industry can maintain that rate it probably will be happy, or at least fortunate. There have been many years in its history when, because of the lack of business, it has operated far below that level.

NO CAUSE FOR ALARM—A drop away from the capacity rate of operations should not be looked upon entirely with alarm. W. H. Colvin Jr., president, Crucible Steel Co. of America, said in an interview on the West Coast that a sizable portion of the demand for steel has come from the steel industry's own expansion program. That 2½-year program is about completed.

UNFINISHED BUSINESS—Regardless of how strong the third-quarter demand is for steel, operations will be lent some support from orders the mills will be unable to fill in the second quarter and will have to carry over into the third. Arrearages in bars, plates, wide flange beams, possibly standard shapes and some major grades of sheets are regarded as a certainty. Producers of these products current on July 1 will be the exception, say some observers.

Carryover of unfilled orders into the third quarter likely will cause some delay in making the new Defense Materials System fully effective. In switching from the Controlled Materials Plan on June 30 to the new DMS on July 1, rated tonnage carried over from the second quarter is to receive preference over nonrated orders until it is worked off.

START ON THIRD QUARTER—Producers booking orders for a whole quarter at a time have already opened their third-quarter books on alloy steels and on cold drawn carbon steels, which require a longer lead time than the hot carbon steels. Third-quarter order books for hot carbon grades will be opened on Apr. 1 or shortly afterward.

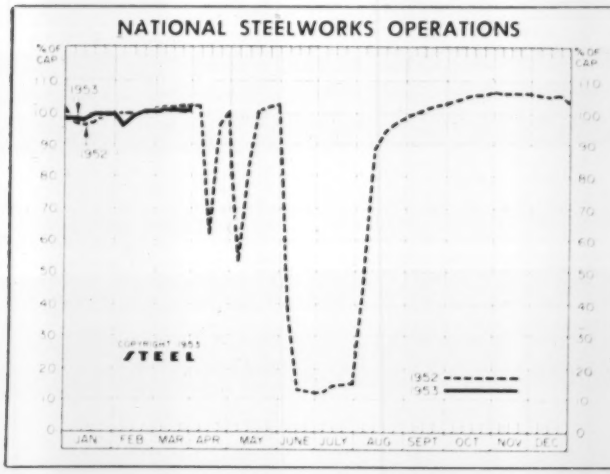
The biggest consumer of steel—the automobile industry—is still pushing hard to get steel. In addition to this tremendous pressure is a strengthening demand from household appliance makers and farm implement manufacturers.

STIMULANT—The high production rate in the auto industry and the strengthening in the appliance field are imparting some life to the lagging business pace of the foundry industry. Foundries serving the automotive industry are extremely busy and those supplying the household appliance makers are benefiting from increases in orders.

Producers of large hot-rolled and cold-finished bars are confronted with more business than they can handle.

SOFT SPOTS—Amidst the tight market in steel are soft spots. Buttweld pipe is becoming increasingly available, and some distributors of it are passing up 30 to 35 per cent of their monthly allotments of it. In the Pittsburgh area, manufacturers' wire is showing signs of slackening. Merchant wire products, such as nails and fence wire, are plentiful. Galvanized sheets are not extremely difficult to get, although demand for them has picked up a little. Foundry pig iron is generally plentiful, largely as result of the lagging business at foundries.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Mar 28	Change	Same Week 1952	Same Week 1951
Pittsburgh	105.5	[illegible]	102.5	101.5
Chicago	104.5	5*	107	108
Mid-Atlantic	97	0	99	100.5
Youngstown	106	0	103	105
Wheeling	100.5	5	100	96
Cleveland	103	3†	99	103
Buffalo	106.5	0	104	104
Birmingham	98.5	5	102	100
New England	85†	3	75	91
Cincinnati	98	3	94	104
St. Louis	82	6	86.4	95
Detroit	109	3	107.5	103.5
Western	108	1.5	105	102
Estimated national rate	101	0*	102	103.5

*Change from preceding week's revised rate.
†Estimated rates are based on Jan. 1, 1953 capacities; others on Jan. 1, 1952 capacities.
Weekly steelmaking capacity is estimated at 2,254,459 net tons in 1953; 2,077,040 tons in 1952; 1,999,034 tons in 1951.

Composite Market Averages

FINISHED STEEL PRICE INDEX Bureau of Labor Statistics	Mar. 24 1953	Mar. 17 1953	Month Ago	March Average
(1947-1949 = 100)	130.7	130.7	130.5	130.7

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Mar. 21, 1953

Units are 100 lb except where otherwise noted below in parentheses. For complete description of products see insert following p. 28, STEEL, Sept. 8, 1952.

Rails	$3.775	Sheets, C.R. carbon	$5.275
Track spikes	6.650	Sheets, galv.	6.765
Track bolts	9.525	Strip, C.R. carbon	5.100
Tie plates	4.775	Strip, C.R. stainless (lb)	0.333
Joint bars	4.925	Pipe, black, buttweld (100 ft)	7.090
Plates, carbon	4.150	Pipe, galv., buttweld (100 ft)	8.778
Structural shapes	4.200	Boiler tubes (100 ft)	31.663
Bars, tool steel (lb)	1.576	Tin plate (100 lb base box)	8.950
Bars, 3120 alloy	6.685	Terne plate (100 lb base box)	7.750
Bars, stainless (lb)	0.152	Wire, carbon, merchant	6.075
Bars, carbon	4.100	Wire, fence, galv.	6.425
Bars, reinforcing	4.050	Nails (100 lb kegs)	7.410
Bars, C.F. carbon	5.925	Wire, barbed (80 rod spool)	5.880
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod roll)	13.629

FINISHED PRICE INDEX, Weighted Calculated by STEEL*

	Mar. 25 1952	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Index (1935-39 av. = 100)	181.31	181.31	181.31	171.92	135.91
Index in cents per lb	4.912	4.912	4.912	4.657	3.682

ARITHMETICAL PRICE COMPOSITES Calculated by STEEL*

Finished Steel NT	$110.38	$110.38	$110.38	$106.32	$81.14
No. 2 Fdry. Pig Iron, T	55.04	55.04	55.04	52.54	39.78
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	39.31
Malleable Pig Iron, GT	55.77	55.77	55.77	53.27	40.41
Steelmaking Scrap, T	44.17	43.17	43.00	43.00	40.25

* For explanation of weighted index see STEEL, Sept. 15, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	Mar. 26 1953	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R., del Philadelphia	4.502	4.502	4.502	4.223	3.356
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.55	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, del. Philadelphia	4.13	4.13	4.13	3.918	2.968
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.45
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.65
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60-75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.71
Sheets, Galv., Pittsburgh	5.025	5.025	5.025	4.80	3.95
Strip, H.R., Pitts.	3.975-4.225	3.975-4.225	3.975-4.225	3.75-4.00	3.05
Strip, H.R., Chicago	3.725	3.725	3.725	3.50	2.80
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.65-5.35	3.80
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.65
Strip, C.R., Detroit	5.30-6.05	5.30-6.05	5.30-6.05	4.85-5.60	3.71
Wire, Basic, Pitts.	5.475-5.225	5.475-5.225	5.475-5.225	4.85-5.10	3.775
Nails, Wire, Pittsburgh	6.35	6.35	6.35	5.90-6.20	5.26
Tin plate box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$6.70

SEMIFINISHED

Billets, forging, Pitts. (NT)	$70.50	$70.50	$70.50	$66.00	$54.00
Wire rods, 5/32", Pitts.	4.425	4.425	4.425	4.10-30	3.175

PIG IRON, Gross Ton

Bessemer, Pitts.	$55.50	$55.50	$55.50	$53.00	$40.906
Basic, Valley	54.50	54.50	54.50	52.00	39.00
Basic, del. Phila.	59.25	59.25	59.25	56.61	42.004
No. 2 Fdry, Pitts.	55.00	55.00	55.00	52.50	40.406
No. 2 Fdry, Chicago	55.00	55.00	55.00	52.50	39.00
No. 2 Fdry, Valley	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry, del. Phila.	59.75	59.75	59.75	57.11	42.504
No. 2 Fdry, Birm.	51.38	51.38	51.38	48.88	37.88
No. 2 Fdry (Birm.) del. Cin.	58.93	58.93	58.93	55.49	42.23
Malleable, Valley	55.00	55.00	55.00	52.50	39.50
Malleable, Chicago	55.00	55.00	55.00	52.50	39.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	55.00
Ferromanganese, Etna, Pa.	228.00	228.00	228.00	188.00	151.00*

*F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts.	$44.00	$44.00	$44.00	$44.00	$40.25
No. 1 Heavy Melt, E. Pa.	46.00	46.00	44.50	42.50	39.00
No. 1 Heavy Melt, Chicago	42.50	42.50	42.50	42.50	39.00
No. 1 Heavy Melt, Valley	44.25	44.25	44.00	44.00	40.25
No. 1 Heavy Melt, Cleve.	44.25	44.25	43.00	43.00	39.75
No. 1 Heavy Melt, Buffalo	47.00	43.50	42.75	43.00	44.00
Rails, Rerolling, Chicago	56.00	56.00	52.50	52.50	49.50
No. 1 Cast, Chicago	43.00	43.00	43.00	49.00†	66.00

†F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn., Connlsvl.	$14.75	$14.75	$14.75	$14.75	$12.50
Beehive, Fdry., Connlsvl.	17.00	17.00	17.00	17.50	14.875
Oven, Fdry., Chicago	24.50	24.50	24.50	23.00	19.25

PIG IRON

F.o.b. furnace prices as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.	....	60.78	61.28	....
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
AlabamaCity,Ala. R2	50.88	51.38	....	....
Birmingham R2	50.88	51.38	....	....
Birmingham S8	....	51.38	....	....
Woodward,Ala. W15	50.88	51.38	....	....
Cincinnati, del.	....	58.93	....	....
Buffalo District				
Buffalo R2	54.50	55.00	55.50	....
Buffalo H1	54.50	55.00	55.50	....
Tonawanda,N.Y. W12	54.50	55.00	55.50	....
No.Tonawanda,N.Y. T5	....	55.00	55.50	....
Boston, del.	65.15	65.65	66.15	....
Rochester,N.Y., del.	57.52	58.02	58.52	....
Syracuse,N.Y., del.	58.62	59.12	59.62	....
Chicago District				
Chicago I-3	54.50	55.00	55.00	55.50
Gary,Ind. U5	54.50	....	55.00	....
IndianaHarbor,Ind. I-2	54.50	....	55.00	....
So.Chicago,Ill. W14	54.50	55.00	55.00	....
So.Chicago,Ill. Y1	54.50	55.00	55.00	....
So.Chicago,Ill. U5	54.50	....	55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon,Mich., del.	....	61.30	61.30	....
Cleveland District				
Cleveland A7	54.50	55.00	55.00	55.50
Cleveland R2	54.50	55.00	55.00	....
Akron,O., del. from Cleve.	57.11	57.61	57.61	58.11
Lorain, O. N3	54.50	....	....	55.50
Duluth I-3	....	....	55.00	....
Erie,Pa. I-3	54.50	55.00	55.00	55.50
Everett,Mass. I1	....	59.50	60.00	....
Fontana,Calif. K1	60.50	61.00	....	....
GraniteCity,Ill. G4	56.40	56.90	57.40	....
St.Louis, del. (inc. 1.8%)	57.15	57.65	58.15	....
Ironton,Utah C11	54.50	55.00	....	....
Geneva,Utah C11	54.50	55.00	....	....
LoneStar, Tex. L6	50.50	*51.00	51.00	....
Minnequa,Colo. C10	56.50	57.50	57.50	....
Rockwood,Tenn. T3	....	....	58.50	....
Pittsburgh District				
Neville Island,Pa. P6	....	55.00	55.00	55.50
Pitts., N.&S. sides, Ambridge	....	....	....	....
Aliquippa, del.	....	56.37	56.37	56.87
McKeesRocks, del.	....	56.04	56.04	56.54
Lawrenceville, Homestead				
Wilmerding, Monaca, del.	....	56.66	56.66	57.16
Verona, Trafford, del.	....	57.19	57.19	57.69
Brackenridge, del.	....	57.45	57.45	57.95
Bessemer,Pa. U5	54.50	....	55.00	55.50
Clairton,Rankin,So.Duquesne,Pa. U5	54.50	....	....	....
McKeesport,Pa. N3	54.50	....	....	55.50
Monessen,Pa. P7	56.50	....	....	....
Sharpsville,Pa. S6	....	....	55.00	55.50
Steelton,Pa. B2	56.50	57.00	57.50	58.00
Swedeland,Pa. A3	58.50	59.00	59.50	60.00
Toledo,O. I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47	....	....
Troy,N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard,O. Y1	54.50	55.00	55.00	....
Youngstown Y1	54.50	55.00	55.00	....
Youngstown U5	54.50	....	....	55.50
Mansfield,O., del.	59.14	59.64	59.64	60.14

*"Low phos." southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si.)

Jackson,O. G2, J1	$65.50
Buffalo H1	66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.04/.05% max P.)

NiagaraFalls,N.Y. P15	$91.00
Keokuk,Iowa, Openhearth & Fdry. frt. allowed K2	92.50
Keokuk, OH & Fdry., 12% lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 3 & 6.)

Lyles,Tenn. T3	$68.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$59.50
Steelton,Pa. B2	62.50
Philadelphia, delivered	66.05
Troy,N.Y. R2	62.50

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL, Mar. 26, 1953, cents per pound except as otherwise noted. Changes shown in italics.

Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)

Fontana,Calif. K1	$81.00
Munhall,Pa. U5	54.00
Seattle S24	75.00

INGOTS, Alloy (NT)

Detroit R7	$57.00
Fontana,Calif. K1	83.00
Houston S5	65.00
Midland,Pa. C18	57.00
Munhall, Pa. U5	57.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Bessemer,Pa. U5	$59.00
ClairtonPa. U5	59.00
Ensley,Ala. T2	59.00
Fairfield,Ala. T2	59.00
Fontana,Calif. K1	78.00
Gary,Ind. U5	59.00
Johnstown,Pa. B2	59.00
Lackawanna,N.Y. B2	59.00
Munhall,Pa. U5	59.00
So.Chicago,Ill. U5	59.00
SoDuquesne,Pa. U5	59.00

Carbon, Forging (NT)

Bessemer,Pa. U5	$70.50
Buffalo R2	70.50
Canton,O. R2	70.50
Clairton,Pa. U5	70.50
Cleveland R2	70.50
Conshohocken,Pa. A3	77.50
Detroit R7	73.50
Ensley,Ala. T2	70.50
Fairfield,Ala. T2	70.50
Fontana,Calif. K1	89.50
Gary,Ind. U5	70.50
Geneva,Utah C11	70.50
Houston S5	78.50
Johnstown,Pa. B2	70.50
Lackawanna,N.Y. B2	70.50
LosAngeles B3	89.50
Munhall,Pa. U5	70.50
Seattle B3	89.50
So.Chicago R2,U5,W14	70.50
So.Duquesne,Pa. U5	70.50
So.SanFrancisco B3	89.50

Alloy, Forging (NT)

Bethlehem,Pa. B2	76.00
Buffalo R2	76.00
Canton, O. R2	76.00
Canton,O. T7	78.60
Conshohocken,Pa. A3	83.00
Detroit R7	79.00
Fontana,Calif. K1	95.00
Gary,Ind. U5	76.00
Houston S5	84.00
Ind.Harbor,Ind. Y1	76.00
Johnstown,Pa. B2	76.00
Lackawanna,N.Y. B2	76.00
LosAngeles B3	96.00
Massillon,O. R2	76.00
Midland,Pa. C18	76.00
Munhall,Pa. U5	76.00
So.Chicago R2,U5,W14	76.00
So.Duquesne,Pa. U5	76.00
Struthers,O. Y1	76.00
Warren,O. C17	76.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2	87.50
Canton,O. R2	87.50
Cleveland R2	87.50
Fontana,Calif. K1	108.50
Gary,Ind. U5	87.50
Massillon,O. R2	87.50
So.Chicago,Ill. R2	87.50
So.Duquesne,Pa. U5	87.50

SHEETS, BARS (NT)

Fontana,Calif. K1	93.18

SKELP

Aliquippa,Pa. J5	3.65
Munhall,Pa. U5	3.55
Warren,O. R2	3.55
Youngstown R2, U5	3.55

WIRE RODS

Alton,Ill. L1	4.70
AlabamaCity,Ala. R2	4.325
Buffalo,W12	4.325
Cleveland A7	4.325
Donora,Pa. A7	4.325
Fairfield,Ala. T2	4.325
Fontana,Calif. K1	5.125
Houston S5	4.725
Johnstown,Pa. B2	4.325
Joliet,Ill. A7	4.325
KansasCity,Mo. S6	4.665
LosAngeles B3	5.125
Minnequa,Colo. C10	4.575
Monessen,Pa. P7	4.525
No.Tonawanda,N.Y. B11	4.325
Pittsburg,Calif. C11	4.975
Portsmouth,O. P12	4.525
Roebling,N.J. R5	4.425
So.Chicago,Ill. R2	4.325
SparrowsPoint,Md. B2	4.425
Sterling,Ill.(1) N15	4.325
Struthers,O. Y1	4.325
Torrance,Calif. C11	5.125
Worcester,Mass. A7	4.625

SHEET STEEL PILING

Ind.Harbor,Ind. I-2	4.675
Lackawanna,N.Y. B2	4.675
Munhall,Pa. U5	4.675
So.Chicago,Ill. U5	4.675

STRUCTURALS

Carbon Steel Stand. Shapes

AlabamaCity,Ala. R2	3.85
Aliquippa,Pa. J5	3.85
Bessemer,Ala. T2	3.85
Bethlehem,Pa. B2	3.90
Clairton,Pa. U5	3.85
Fairfield,Ala. T2	3.85
Fontana,Calif. K1	4.50
Gary,Ind. U5	3.85
Geneva,Utah C11	3.85
Houston S5	4.25
Ind.Harbor,Ind. I-2	3.85
Johnstown,Pa. B2	3.90
KansasCity,Mo. S5	4.45
Lackawanna,N.Y. B2	3.90
LosAngeles B3	4.45
Minnequa,Colo. C10	4.30
Munhall,Pa. U5	3.85
Niles,Calif.(22) P1	4.56
Phoenixville,Pa. P4	4.95
Seattle B3	4.50
So.Chicago,Ill. U5, W14	3.85
So.SanFrancisco B3	4.40
Torrance,Calif. C11	4.45
Weirton,W.Va. W6	4.10

Wide Flange

Bethlehem,Pa. B2	3.90
Clairton,Pa. U5	3.85
Fontana,Calif. K1	5.05
Johnstown,Pa. B2	3.90
Lackawanna,N.Y. B2	3.90
Munhall,Pa. U5	3.85
So.Chicago,Ill. U5	3.85

Alloy Stand. Shapes

Clairton,Pa. U5	4.725
Fontana,Calif. K1	5.925
Gary,Ind. U5	4.725
Munhall,Pa. U5	4.725
So.Chicago,Ill. U5	4.725

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5	5.80
Bessemer,Ala. T2	5.80
Bethlehem,Pa. B2	5.80
Clairton,Pa. U5	5.80
Fairfield,Ala. T2	5.80
Fontana,Calif. K1	6.45
Gary,Ind. U5	5.80
Geneva,Utah C11	5.80
Ind.Harbor,Ind. I-2	5.80
Ind.Harbor,Ind. Y1	6.30
Johnstown,Pa. B2	5.80
Lackawanna,N.Y. B2	5.80
LosAngeles B3	6.35
Munhall,Pa. U5	5.80
Seattle B3	6.40
So.Chicago,Ill. U5	5.80
So.SanFrancisco B3	6.30
Struthers,O. Y1	6.30

H.S., L.A. Wide Flange

Bethlehem,Pa. B2	5.80
Lackawanna,N.Y. B2	5.80
Munhall,Pa. U5	5.75
So.Chicago,Ill. U5	5.75

BEARING PILES

Munhall,Pa. U5	3.85
So.Chicago,Ill. U5	3.85

PLATES,High-Strength Low-Alloy

Aliquippa,Pa. J5	5.95
Bessemer,Ala. T2	5.95
Clairton,Pa. U5	5.95
Cleveland J5, R2	5.95
Conshohocken,Pa. A3	6.20
Ecorse,Mich. G5	6.00
Fairfield,Ala. T2	5.95
Fontana,Calif.(30) K1	6.65
Gary,Ind. U5	5.95
Geneva,Utah C11	5.95
Ind.Harbor,Ind. I-2	5.95
Ind.Harbor,Ind. Y1	6.45
Johnstown,Pa. B2	5.95
Munhall,Pa. U5	5.95
Pittsburgh J5	5.95
Seattle B3	6.85
Sharon,Pa. S3	5.95
So.Chicago,Ill. U5	5.95
SparrowsPoint,Md. B2	5.95
Warren,O. R2	5.95
Youngstown Y1	6.45
Youngstown U5	5.95

PLATES, Open-Hearth Alloy

Claymont,Del. C22	5.35
Coatesville,Pa. L7	5.75
Conshohocken,Pa. A3	5.50
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.25
Johnstown,Pa. B2	5.25
Munhall,Pa. U5	5.25
Sharon,Pa. S3	5.70
So.Chicago,Ill. U5	5.25
SparrowsPoint,Md. B2	5.25

FLOOR PLATES

Cleveland J5	4.95
Conshohocken,Pa. A3	4.95
Ind.Harbor,Ind. I-2	4.95
Munhall,Pa. U5	4.95
So.Chicago,Ill. U5	4.95

PLATES, Ingot Iron

Ashland,c.l. (15) A10	4.15
Cleveland,c.l. R2	4.50
Warren,O.,c.l. R2	4.50

PLATES, Carbon Steel

AlabamaCity,Ala. R2	3.90
Aliquippa,Pa. J5	3.90
Ashland,Ky. (15) A10	3.90
Bessemer,Ala. T2	3.90
Clairton,Pa. U5	3.90
Claymont,Del. C22	4.35
Cleveland J5, R2	3.90
Coatesville,Pa. L7	4.35
Conshohocken,Pa. A3	4.35
Ecorse,Mich. G5	4.45
Fairfield,Ala. T2	3.90
Fontana,Calif.(30) K1	4.55
Gary,Ind. U5	3.90
GraniteCity,Ill. G4	4.60
Geneva,Utah C11	3.90
Harrisburg,Pa. C5	6.50
Houston S5	4.30
Ind.Harbor,Ind. I-2, Y1	3.90
Johnstown,Pa. B2	3.90
Lackawanna,N.Y. B2	3.90
Minnequa,Colo. C10	4.70
Munhall,Pa. U5	3.90
Pittsburgh J5	3.90
Seattle B3	4.80
Sharon,Pa. S3	4.15
So.Chicago,Ill. U5, W14	3.90
SparrowsPoint,Md. B2	3.90
Steubenville,O. W10	3.90
Warren,O. R2	3.90
Weirton,W.Va. W6	4.20
Youngstown R2, U5, Y1	3.90

PLATES, Carbon A.R

Fontana,Calif. K1	5.70
Geneva,Utah, C11	5.05

PLATES, Wrought Iron

(Add 4.7¢ to base and extras)

Economy Pa. B14	8.60

BARS, Hot-Rolled Carbon

AlabamaCity,Ala. R2	3.95
Aliquippa,Pa. J5	3.95
Alton,Ill. L1	4.50
Atlanta,Ga. A11	4.50
Bessemer,Ala. T2	3.95
Buffalo R2	3.95
Canton,O. R2	3.95
Clairton,Pa. U5	3.95
Cleveland R2	3.95
Detroit R7	4.10
Ecorse,Mich. G5	4.30
Emeryville,Calif. J7	4.70
Fairfield,Ala. T2	3.95
Fontana,Calif. K1	4.65
Gary,Ind. U5	3.95
Houston S5	4.35
Ind.Harbor,Ind. I-2, Y1	3.95
Johnstown,Pa. B2	3.95
KansasCity,Mo. S5	4.55
Lackawanna,N.Y. B2	3.95
LosAngeles B3	4.65
Milton,Pa. B6	4.55
Minnequa,Colo. C10	4.40
Niles,Calif. P1	4.65
N.Tonawanda,N.Y. B11	3.95
Pittsburg,Calif. C11	4.65
Pittsburgh J5	3.95
Seattle B3, N14	4.70
So.Chicago R2,U5,W14	3.95
So.Duquesne,Pa. U5	3.95
So.SanFran.,Calif. B3	4.70
Sterling,Ill. N15	4.55
Struthers,O. Y1	3.95
Torrance,Calif. C11	4.65
Weirton,W.Va. W6	4.10
Youngstown R2, U5	3.95

BAR SIZE ANGLES, S. Shapes

Aliquippa,Pa. J5	3.95
Atlanta,Ga. A11	4.50
Niles,Calif. P1	4.65
SanFrancisco S7	5.00

BAR SIZE ANGLES, H.R CARBON

Bethlehem,Pa. B2	4.15

BARS,Hot-Rolled Alloy

Bethlehem,Pa. B2	4.675
Buffalo R2	4.675
Canton,O. R2	4.675
Canton,O. T7	4.72
Clairton,Pa. U5	4.675
Detroit R7	4.825
Ecorse,Mich. G5	5.025
Fontana,Calif. K1	5.725
Gary,Ind. U5	4.675
Houston S5	5.075
Ind.Harbor,Ind. I-2, Y1	4.675
Johnstown,Pa. B2	4.675
KansasCity,Mo. S5	5.275
Lackawanna,N.Y. B2	4.675
LosAngeles B3	5.725
Massillon,O. R2	4.675
Midland,Pa. C18	4.675
So.Chicago R2,U5, W14	4.675
So.Duquesne,Pa. U5	4.675
Struthers,O. Y1	4.675
Warren,O. C17	4.675
Youngstown U5	4.675

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5	4.925
Gary,Ind. U5	4.925
Youngstown U5	4.925

BARS & SMALL SHAPES, H. R., High-Strength Low-Alloy

Aliquippa,Pa. J5	5.925
Bessemer,Ala. T2	5.925
Bethlehem,Pa. B2	5.925
Clairton,Pa. U5	5.925
Cleveland R2	5.925
Ecorse,Mich. G5	6.675
Fairfield,Ala. T2	5.925
Fontana,Calif. K1	6.975
Gary,Ind. U5	5.925
Ind.Harbor,Ind. I-2	5.925
IndianaHarbor,Ind. Y1	6.425
Johnstown,Pa. B2	5.925
Lackawanna,N.Y. B2	5.925
LosAngeles B3	6.625
Pittsburgh J5	5.925
Seattle B3	6.675
So.Duquesne,Pa. U5	5.925
So.SanFrancisco B3	6.625
Struthers,O. Y1	6.425
Youngstown U5	5.925

BARS, Cold-Finished Carbon

Ambridge,Pa. W18	4.925
BeaverFalls,Pa. R2	4.925
BeaverFalls,Pa. M12	4.925
Buffalo B5	4.975
Camden,N.J. P13	5.375
Carnegie,Pa. C12	4.925
Chicago B5	4.925
Chicago W18	4.925
Cleveland A7, C20	4.925
Detroit P17, R7	5.075
Detroit B5	5.125
Donora,Pa. A7	4.925
Elyria,O. W8	4.925
FranklinPark,Ill. N5	4.925
Gary,Ind. R2	4.925
GreenBay,Wis. F7	4.925
Hammond,Ind. I-2,M13	4.925
Hartford,Conn. R2	5.475
LosAngeles R2	6.375
Mansfield,Mass. B5	5.475
Massillon,O. R2, R8	4.925
Monaca,Pa. S17	4.925
Newark,N.J. W18	5.375
Plymouth,Mich. P5	5.175
Pittsburgh J5	4.925
Putnam,Conn. W18	5.475
Readville,Mass. C14	5.475
St.Louis,Mo. M5	5.30
So.Chicago,Ill. W14	4.925
SpringCity,Pa. K3	5.375
Struthers,O. Y1	4.925
Waukegan,Ill. A7	4.925
Youngstown Y1	4.925
Youngstown F3	4.925

BARS, Cold-Finished Alloy

Ambridge,Pa. W18	6.00
BeaverFalls,Pa. M12	6.00
Bethlehem,Pa. B2	6.00
Buffalo B5	6.00
Camden,N.J. P13	6.40
Canton,O. R2	6.00
Canton,O. T7	5.99
Carnegie,Pa. C12	6.00
Chicago B5	6.00
Chicago W18	6.00
Cleveland A7	6.05
Cleveland C20	6.00
Detroit P17, R7	6.15
Detroit B5	6.20
Donora,Pa. A7	6.05
Elyria,O. W8	6.00
Gary,Ind. R2	6.00
Hammond,Ind. I-2, M13	6.00
Hartford,Conn. R2	6.45
Lackawanna,N.Y. R2	6.00
Mansfield,Mass. B5	6.45
Massillon,O. R2 R8	6.00
Midland,Pa. C18	6.00
Monaca,Pa. S17	6.00
Newark,N.J. W18	6.35
Plymouth,Mich. P5	6.20
So.Chicago,Ill. R2, W14	6.00
SpringCity,Pa. K3	6.20
Struthers,O. Y1	6.00
Warren,O. C17	6.00
Waukegan,Ill. A7	6.05
Worcester,Mass. A7	6.35
Youngstown Y1	6.00
Youngstown F3	6.00

BARS, Reinforcing (Fabricators)

AlabamaCity,Ala. R2	3.95
Atlanta A11	4.50
Buffalo R2	3.95
Cleveland R2	3.95
Emeryville,Calif. J7	4.70
Fairfield,Ala. T2	3.95
Fontana,Calif. K1	4.65
Gary,Ind. U5	3.95
Houston S5	4.35
Ind.Harbor,Ind. I-2, Y1	3.95
Johnstown,Pa. B2	3.95
Lackawanna,N.Y. B2	3.95
LosAngeles B3	4.65
Milton,Pa. B6	4.55
Minnequa,Colo. C10	4.75
Niles,Calif. P1	4.65
Pittsburg,Calif. C11	4.65
Pittsburgh J5	3.95
SandSprings,Okla. S6	4.85
Seattle B3, N14	4.70
So.Chicago,Ill. R2	3.95
So.Duquesne,Pa. U5	3.95
So.SanFrancisco B3	4.70
SparrowsPoint,Md. B2	3.95
Sterling,Ill.(1) N15	4.70
Struthers,O. Y1	3.95
Youngstown R2, U5	3.95

BARS, Reinforcing (Fabricated, to consumers)

Huntington,W.Va. W7	5.50
Johnstown, ½-1" B2	5.25
KansasCity S6	6.05
LosAngeles B3	5.45
Marion,O. P11	5.25
Seattle B3, N14	5.80
SandSprings S6	6.45
So.SanFrancisco B3	5.45
SparrowsPt. ½-1" B2	5.25
Williamsport Pa. S19	5.30

RAIL STEEL BARS

ChicagoHts.(3,4) C2	4.75
ChicagoHts.(3,4) I-2	4.75
Franklin Pa.(3,4) F3	4.75
FortWorth,Tex.(26) T4	4.85
Huntingt.W.Va.(3) W7	5.25
Marion,O.(3) P11	4.75
Moline,Ill.(3) R2	4.65
Tonawanda(3,4) B12	5.00
Williamsport(3) S19	5.25
Williamsport(4) S19	5.35

BARS, Wrought Iron

(Add 4.7¢ to base and extras)

Economy Pa.(S.R.) B14	9.60
Economy Pa.(D.R.) B14	11.90
Economy Staybolt) B14	12.20
Mc.K Rks.(Staybolt) L5	14.50
Mc.K Rks.(S.R.) L5	9.60
Mc.K Rks.(D.R.) L5	13.00

SHEETS, Hot-Rolled Steel

(18 gage and heavier)

AlabamaCity,Ala. R2	3.775
Ashland,Ky.(c-s) A10	3.775
Butler,Pa. A10	3.775
Cleveland J5, R2	3.775
Conshohocken,Pa. A3	4.175
Detroit M1	4.40
Ecorse,Mich. G5	3.975
Fairfield,Ala. T2	3.775
Fontana,Calif. K1	4.825
Gary,Ind. U5	3.775
Geneva,Utah C11	3.875
GraniteCity,Ill. G4	4.30
Ind.Harbor,Ind. I-2, Y1	3.775
Irvin,Pa. U5	3.775
Lackawanna,N.Y. B2	3.775
Munhall,Pa. U5	3.775
Niles,O. N12	3.825
Pittsburg,Calif. C11	4.475
Pittsburgh J5	3.775
Sharon,Pa. S3	4.175
So.Chicago,Ill. W14	3.775
SparrowsPoint,Md. B2	3.775
Steubenville,O. W10	3.775
Torrance,Calif. C11	4.475
Warren,O. R2	3.775
Weirton,W.Va. W6	3.775
WestLeechburg,Pa. A4	3.925
Youngstown U5, Y1	3.775

SHEETS, H.R. (19 gage)

AlabamaCity,Ala. R2	4.925
Dover,O. B1	4.825
Mansfield,O. E6	4.95
Niles,O. N12	4.675
Torrance,Calif. C11	5.575

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland J5, R2	5.675
Conshohocken,Pa. A3	5.925
Ecorse,Mich. G5	6.225
Fairfield,Ala. T2	5.675
Fontana,Calif. K1	6.775
Gary,Ind. U5	5.675
Ind.Harbor,Ind. I-2	5.675
Ind.Harbor,Ind. Y1	6.175
Irvin,Pa. U5	5.675
Lackawanna(35) B2	5.675
Munhall,Pa. U5	5.675
Pittsburgh J5	5.675
Sharon,Pa. S3	5.675
So.Chicago,Ill. U5	5.675
SparrowsPoint(36) B2	5.675
Warren,O. R2	5.675
Weirton,W.Va. W6	6.025
Youngstown U5	5.675
Youngstown Y1	6.175

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2	6.925
Ecorse,Mich. G5	7.475
Fontana,Calif. K1	7.875
Gary,Ind. U5	6.925
IndianaHarbor,Ind. Y1	7.425
IndianaHarbor,Ind. I-2	6.925
Irvin,Pa. U5	6.925
Lackawanna(37) B2	6.925
Pittsburgh J5	6.925
SparrowsPoint(38) B2	6.925
Warren,O. R2	6.925
Weirton,W.Va. W6	7.275
Youngstown Y1	7.425

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.575
Cleveland, J5, R2	4.575
Ecorse,Mich. G5	4.775
Fairfield,Ala. T2	4.575
Follansbee,W.Va. F4	5.575
Fontana,Calif. K1	5.675
Gary,Ind. U5	4.575
GraniteCity,Ill. G4	5.275
Ind.Harbor,Ind. I-2,Y1	4.575
Irvin,Pa. U5	4.575
Lackawanna,N.Y. B2	4.575
Middletown,O. A10	4.575
Pittsburg,Calif. C11	5.525
Pittsburgh,Pa. J5	4.575
SparrowsPoint,Md. B2	4.575
Steubenville,O. W10	4.575
Warren,O. R2	4.575
Weirton,W.Va. W6	4.575
WestLeechburg,Pa. A4	5.45
Youngstown Y1	4.575

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	5.075
Ashland,Ky.(8) A10	5.075
Canton,O. R2	5.075
Delphos,O. N10	5.075
Dover,O. R1	5.775
Fairfield,Ala. T2	5.075
Gary,Ind. U5	5.075
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	5.075
Irvin,Pa. U5	5.075
Kokomo,Ind.(13) C16	5.475
MartinsFerry,O. W10	5.075
Niles,O. N12	6.275
Pittsburg,Calif. C11	5.825
SparrowsPoint,Md. B2	5.075
Steubenville,O. W10	5.075
Tortrance,Calif. C11	5.825
Weirton,W.Va. W6	5.075

SHEETS, Galvanized No. 10, High Strength Low-Alloy

Irvin,Pa. U5	7.625
SparrowsPoint(39) B2	7.775

SHEETS, Galvannealed Steel

Canton,O. R2	5.625
Irvin,Pa. U5	5.625
Kokomo,Ind.(13) C16	6.025
Niles,O. N12	6.825

SHEETS ZINCGRIP Steel No. 10

Butler,Pa. A10	5.325
Middletown,O. A10	5.325

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.925
Niles,O. R2 (28)	5.925
Weirton,W.Va. W6	5.775

SHEETS, Well Casing

Fontana,Calif. K1	5.34

BLUED Stock, 29 ga.

Yorkville,O. W10	7.00
Follansbee,W.Va. F4	7.10
Follansbee (23) F4	6.425

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.925
Cleveland R2	4.925
Gary,Ind. U5	4.925
GraniteCity,Ill. G4	5.625
Ind.Harbor,Ind. I-2	4.925
Irvin,Pa. U5	4.925
Middletown,O. A10	4.925
Youngstown Y1	4.925

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2 Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40		
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R (22 Ga.) COILS (Cut lengths 1/2c lower)

	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut lengths)		7.85	9.10	9.90
Brackenridge Pa. A4		8.35	9.60	10.40
GraniteCity,Ill. G4 (cut lengths)		8.55	9.80	
IndianaHarbor,Ind. I-2	7.55	7.85	(31)	(41)
Mansfield,O. E6 (cut lengths)	7.20	7.35	7.85	9.10 9.90
Niles,O. N12 (cut lengths)	7.05	7.35	7.85	
Vandergrift,Pa. U5		7.85	8.35	9.60 10.40
Warren,O. R2	7.55	7.85	8.35	9.60 10.40
Zanesville,O. A10		7.85	8.35	9.65 10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut length 1/2c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.95			
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95			
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)			15.35	15.85
Vandergrift,Pa. U5	13.50	14.35	15.35	15.85

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.30

SHEETS, Culvert No. 16

	Cu	Cu
	Alloy	Fe
Ashland,Ky. A10	5.825	
Canton,O. R2	5.925	6.375
Fairfield,Ala. T2	5.875	6.125
Gary,Ind. U5	5.875	6.125
Ind.Harbor,Ind. I-2	5.875	6.125
Irvin,Pa. U5	5.875	6.125
Kokomo,Ind. C16	6.525	
MartinsFy.,O. W10	5.875	
Pittsburg,Cal.C11	6.625	
SparrowsPt. B2	5.875	
Torrance,Cal.C11	6.625	

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	6.125
Fairfield,Ala. T2	6.125
MartinsFerry,O. W10	6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	4.025
Cleveland R2	4.375
Ind.Harbor,Ind. I-2	4.025
Warren,O. R2	4.375

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10	5.075
Cleveland R2	5.175
Middletown,O. A10	5.075
Warren,O. R2	5.175

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.325
Canton,O. R2	5.825

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.575
Middletown,O. A10	5.575

SHEETS, ALUMINIZED

Butler,Pa. A10	8.425

TIN PLATE, American 1.25 Coke (Base Box)

	lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.65

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.475
Gary,Ind. U5	5.475
Mansfield,O. E6	6.05
Middletown,O. A10	5.475
Niles,O. N12	6.275
Weirton,W.Va. W6	5.475

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.875

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.75

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.65
Conshohocken,Pa. A3	5.90
Ecorse,Mich. G5	6.30
Fairfield,Ala. T2	5.65
Fontana,Calif. K1	6.55
Gary,Ind. U5	5.65
Ind Harb.,Ind. I-2	5.65
Ind Harbor,Ind. Y1	6.15
Lackawanna,N.Y. B2	5.70
LosAngeles(25) B3	6.40
Seattle(25) B3	6.65
Sharon,Pa. S3	5.65
So.SanFrancisco(25) B3	6.40
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.65
Weirton,W.Va. W6	6.10
Youngstown Y1	6.15
Youngstown U5	5.95

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	7.45
Cleveland A7	7.30
Dover,O. G6	8.00
Ecorse,Mich. G5	8.15
Lackawanna,N.Y. B2	7.90
Sharon,Pa. S3	7.30
SparrowsPoint,Md. B2	7.90
Warren,O. R2	7.30
Weirton,W.Va. W6	7.95
Youngstown Y1	7.80

STRIP, Hot-Rolled Carbon

Ala City,Ala.(27) R2	3.725
Alton,Ill. L1	4.20
Ashland,Ky.(8) A10	3.725
Atlanta A11	4.275
Bessemer,Ala. T2	3.725
Bridgeport,Con.(10)S15	4.225
Buffalo(27) R2	3.725
Butler,Pa. A10	3.725
Carnegie,Pa. S18	4.225
Conshohocken,Pa. A3	4.125
Detroit M1	4.40
Ecorse,Mich. G5	4.025
Fairfield,Ala. T2	3.725
Fontana,Calif. K1	5.175
Gary,Ind. U5	3.725
Houston,Tex. S5	4.125
Ind.Harbor,Ind. I-2,Y1	3.725
Johnstown,Pa.(25) B2	3.725
KansasCity,Mo.(9) S5	4.325
Lackawna,N.Y.(32) B2	3.725
LosAngeles(25) B1	4.475
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.775
NewBritain(10) S15	4.225
N.Tonawanda,N.Y. B11	3.725
Pittsburg,Calif. C11	4.475
Riverdale,Ill. A1	3.725
SanFrancisco S7	5.00
Seattle(25) B3	4.725
Seattle N14	4.75
Sharon,Pa. S3	4.225
So.Chicago,Ill. W14	3.725
So.SanFrancisco(25) B3	4.475
SparrowsPoint,Md. B2	3.725
Sterling,Ill. N15	4.725
Torrance,Calif. C11	4.475
Warren,O. R2	3.725
Weirton,W.Va. W6	3.825
WestLeechburg,Pa. A4	3.975
Youngstown U5, Y1	3.725

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	6.05
Carnegie,Pa. S18	6.45
Fontana,Calif. K1	7.30
Gary,Ind. U5	6.10
Houston,Tex. S5	6.50
KansasCity,Mo. S5	6.70
Midland,Pa. C18	6.85
NewBritn.,Conn.(10) S15	6.05
Sharon,Pa. S3	6.45
Youngstown U5	6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(10) G6	5.50
Bridgeprt,Conn.(10) S15	5.50
Butler,Pa. A10	5.10
Cleveland A7, J5	5.10
Dearborn,Mich. D3	9.05
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	5.50
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	6.75
FranklinPark,Ill.(40) T6	5.45
Ind Harbor,Ind. I-2	5.45
Lackawanna,N.Y. B2	5.10
LosAngeles C1	6.85
Mattapan,Mass. T6	5.95
Middletown,O. A10	5.10
NewBritain(10) S15	5.50

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Beteg,O. C7		6.50	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
Bristol,Conn. W1			8.55	10.50	
Carnegie,Pa. S18		7.65	8.25	10.20	12.50
Cleveland A7	5.10	7.30	8.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	8.60		
Detroit D2	6.45	7.50	8.10		
Dover,O. G6	5.70	7.65	8.25	10.20	12.50
FranklinPark,Ill. T6	5.45	7.45	8.40	10.35	12.65
Harrison,N.J. C18			8.55	10.50	12.80
Mattapan,Mass. T6	5.95	7.60	8.55	10.50	12.80
NewBritn.,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
NewCastle,Pa. B4	5.80	7.65	8.25	10.20	
NewCastle,Pa. B5	5.80	7.65	8.25	10.20	12.50
NewHaven,Conn. I2	6.70	7.60	8.20		
NewYork W3		7.95	8.55	10.50	12.80
Pawtucket,R.I. N8:					
Cleve.orPitts.Base		7.65	8.25	10.20	12.50
Worcester,Mass.,Base	6.30	7.95	8.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	8.25	10.20	12.50
Trenton,N.J. R5		7.95	8.55	10.50	12.80
Wallingford,Conn. W2	6.30	7.60	8.20	10.15	12.65
Warren,O. T5	6.20	7.65	8.25	10.20	12.50
Weirton,W.Va. W6	5.80	7.65	8.25	10.20	12.50
Worcester,Mass. A7	5.40	7.60	8.55	10.50	12.80
Worcester,Mass. T6	5.95	7.60	8.55	10.50	12.80
Youngstown C8		7.65	8.25	10.20	12.50

Spring Steel (Tempered)

Trenton,N.J. R5 (29)		10.30	12.50	15.35
Harrison,N.J. C18		10.30	12.50	15.35
NewYork W3		10.30*	12.50*	15.35*
Youngstown C8		10.30	12.50	15.35

* Plus 1.575 per 100 lb.

STRIP, Hot-Rolled Alloy

NewCastle,Pa. B4	5.80
NewCastle,Pa.(40) E5	5.70
NewHaven,Conn. I2	5.85
NewHaven,Conn. A7	5.60
Pawtucket,R.I. B3	6.45
Pawtucket,R.I.(21) N8	6.30
Riverdale,Ill.(40) A1	5.35
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.80
SparrowsPoint,Md. B2	5.10
Trenton,N.J. R5	6.45
Wallingford,Conn. W2	6.30
Warren,O.(40) T5	5.70
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown C8 (40)	5.70
Youngstown Y1	5.10

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.70
Weirton,W.Va. W6	5.10
Youngstown C8	5.70

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	12.15
Carnegie,Pa. S18	12.00
Cleveland A7	11.40
Dover,O. G6	11.90
Fontana,Calif. K1	13.05
Harrison,N.J. C18	12.00
Midland,Pa. C18	12.00
NewBritn,Conn.(10) S15	12.15
Pawtucket,R.I.(11) N8	12.15
Pawtucket,R.I.(12) N8	12.45
Sharon,Pa. S3	12.00
Worcester,Mass. A7	11.70
Youngstown C8	12.00

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.975
Warren,O. R2	4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.70

TIGHT COOPERAGE HOOP

Atlanta A11	4.45
Riverdale,Ill. A1	4.30
Sharon,Pa. S3	4.55
Youngstown U5	4.15

Key to Producers

A1 Acme Steel Co.	
A3 Alan Wood Steel Co.	
A4 Allegheny Ludlum Steel	
A7 American Steel & Wire	
A8 Anchor Drawn Steel Co.	
A9 Angell Nail & Chaplet	
A10 Armco Steel Corp.	
A11 Atlantic Steel Co.	
A13 American Cladmetals Co.	
B1 Babcock & Wilcox Co.	
B2 Bethlehem Steel Co.	
B3 Beth. Pac. Coast Steel	
B4 Blair Strip Steel Co.	
B5 Bliss & Laughlin Inc.	
B6 Bourdi Steel Corp.	
B8 Braeburn Alloy Steel	
B11 Buffalo Bolt Co.	
B12 Buffalo Steel Div., H. K. Porter Co.	
B14 A. M. Byers Co.	
C1 Calstrip Steel Corp.	
C2 Calumet Steel Div. Borg-Warner Corp.	
C4 Carpenter Steel Co.	
C5 Central Iron & Steel Div. Harsium Steel Corp.	
C7 Cleve. Cold Rolling Mills	
C8 Cold Metal Products Co.	
C9 Colonial Steel Co.	
C10 Colorado Fuel & Iron	
C11 Columbia-Geneva Steel	
C12 Columbia Steel & Shaft.	
C13 Columbia Tool Steel Co.	
C14 Compressed Steel Shaft.	
C16 Continental Steel Corp.	
C17 Copperweld Steel Co.	
C18 Crucible Steel Co.	
C19 Cumberland Steel Co.	
C20 Cuyahoga Steel & Wire	
C22 Claymont Steel Products Dept., Wickwire Spencer Steel Division	
D2 Detroit Steel Corp.	
D3 Detroit Tube & Steel	
D4 Disston & Sons, Henry	
D6 Driver Harris Co.	
D7 Dickson Weatherproof Nail Co.	
E1 Eastern Gas&Fuel Assoc.	
E2 Eastern Stainless Steel	
E4 Electro Metallurgical Co.	
E5 Elliott Bros. Steel Co.	
E6 Empire Steel Corp.	
F2 Firth Sterling Inc.	
F3 Fitzsimons Steel Co.	
F4 Follansbee Steel Corp.	
F5 Franklin Steel Div. Borg-Warner Corp.	
F6 Fretz-Moon Tube Co.	
F7 Ft. Howard Steel & Wire	
G2 Globe Iron Co.	
G4 Globe Steel Tubes Co.	
G4 Granite City Steel Co.	
G5 Great Lakes Steel Corp.	
G6 Greer Steel Co.	
H1 Hanna Furnace Corp.	
I-1 Igoe Bros. Inc.	
I-2 Inland Steel Co.	
I-3 Interlake Iron Corp.	
I-4 Ingersoll Steel Div. Borg-Warner Corp.	
I-7 Indiana Steel & Wire Co.	
J1 Jackson Iron & Steel Co.	
J3 Jessop Steel Co.	
J4 Johnson Steel & Wire Co.	
J5 Jones & Laughlin Steel	
J6 Joslyn Mfg. & Supply	
J7 Judson Steel Corp.	
J8 Jersey Shore Steel Co.	
K1 Kaiser Steel Corp.	
K2 Keokuk Electro Metals	
K3 Keystone Drawn Steel	
K4 Keystone Steel & Wire	
L1 Laclede Steel Co.	
L2 LaSalle Steel Co.	
L3 Latrobe Steel Co.	
L5 Lockhart Iron & Steel	
L6 Lone Star Steel Co.	
L7 Lukens Steel Co.	

WIRE, Merchant Quality

(6 to 8 gage)	An'ld.	Galv.
AlabamaCity R2	6.075	6.325
Aliquippa J5	6.075	6.525‡
Atlanta A11	6.325	6.675
Bartonville(19)K4	6.075	6.40
Buffalo W12	5.225	
Cleveland A7	6.075	6.225
CrawfordsvilleMS	6.175	6.475
Donora,Pa. A7	6.075	6.225
Duluth,Minn. A7	6.075	6.225
Fairfield T2	6.075	6.225
Houston,Tex. S5	6.475	6.80
Johnstown B2	6.075	6.45†
Joliet,Ill. A7	6.075	6.225
KansasCy,Mo. S5	6.675	7.00
Kokomo C16	6.175	6.425
LosAngeles B3	7.025	
Minnequa C10	6.325	6.70*
Monessen P7	6.075	6.45
Palmer W12	5.525	
Pitts.,Calif. C11	7.025	7.175
Pittsmth.(18)P12	6.475	
Rankin A7	6.075	6.225
So.Chicago R2	6.075	6.325
So.S.Fran. C10	7.025	7.40*
SparrowsPt. B2	6.175	6.55†
Sterling,Ill.(1)N15	6.075	6.375
Struthers,O. Y1	6.075	6.475
Torrance,Cal. C11	7.025	
Worcester A7	6.375	6.525

*Based on 14c zinc; $14.50c zinc; ‡17.5c zinc.

WIRE (16 gage)	Anl'd.	Galv.
(Add 4.7½ on base and extras)	Stone	Stone
Aliquippa J5	10.15	12.15
Bartonville(19)K4	10.25	12.00*
Cleveland A7	10.25	11.55
Crawfrdsville MS	10.74	12.51
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.73	12.58‡
Kokomo C16	10.625†	12.325‡
Minnequa C10	10.40	12.425*
Palmer,Mass. W12	10.25	12.15
Pitts.,Cal. C11	10.60	11.90
SparrowsPt. B2	10.84	12.68‡
Sterling(1) N15	10.73†	12.15†
Waukegan A7	10.25	11.55
Worcester A7		11.85

*Based on 14c zinc; $14.50c zinc. †Includes 4.7½ increase.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.225
Aliquippa,Pa. J5 (42)	4.85
Atlanta A11	5.475
Alton,Ill. L1	5.45
Bartonville,Ill. K4	5.325
Buffalo W12	5.225
Chicago W13	5.475
Cleveland A7, C20	5.225
Crawfordsville,Ind. MS	5.325
Donora,Pa. A7	5.225
Duluth,Minn. A7	5.225
Fairfield,Ala. T2	5.225
Fostoria,O. (24) S1	5.725
Houston S5	5.625
Johnstown,Pa. B2	5.225
Joliet,Ill. A7	5.225
KansasCity,Mo. S5	5.825
Kokomo,Ind. C16	5.325
LosAngeles B3	6.175
Minnequa,Colo. C10	5.475
Monessen,Pa. P7	5.475
Newark 6.8 ga. L1	5.88
No.Tonawanda,N11	5.225
Palmer,Mass. W12	5.525
Pittsburg,Calif. C11	6.175
Portsmouth,O. P12	5.625
Rankin,Pa. A7	5.225
So.Chicago,Ill. R2	5.225
So.SanFrancisco C10	6.175
SparrowsPoint,Md. B2	5.325
Sterling,Ill. (1) N15	5.225
Struthers,O. Y1	5.225
Torrance,Calif. C11	6.175
Waukegan,Ill. A7	5.225
Worcester,Mass. A7	5.525

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12 (43)	6.35
Cleveland A7 (43)	5.85
Crawfordsville,Ind. MS(48)	5.70
Dover,O. G6	6.20
Fostoria,O. S1 (43)	6.00
Kokomo,Ind. C16 (43)	5.70
Franklin Park,Ill. T6(43)	6.20
Massillon,O. R8 (43)	5.85
Monessen,Pa. P16 (43)	6.35
Monessen,Pa. P7 (43)	6.10
Pawtkt.R.I.(12) N8 (43)	6.85
Trenton,N.J. R5 (43)	6.15
Worcester,Mass. A7 (43)	6.15
Worcester,Mass. T6 (43)	6.50
Worcester,Mass.W12(43)	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.90
Monessen,Pa. P16 (43)	8.50
Muncie,Ind. I-7 (43)	8.70
Roebling,N.J. R5 (43)	8.80
SparrowsPt.,Md. B2(43)	8.60
Johnstown,Pa. B2 (43)	8.50

ROPE WIRE

Alton,Ill. L1 (43)	8.75
Bartonville,Ill. K4	8.95
Buffalo W12 (43)	8.55
Fostoria,O. S1 (43)	8.85
Johnstown,Pa. B2 (43)	8.55
Monessen,Pa. P16 (43)	8.55
Monessen,Pa. P7 (43)	8.80
Muncie,Ind. I-7 (43)	8.75
Palmer,Mass. W12 (43)	8.85
Portsmouth,O. P12 (43)	8.55
Roebling,N.J. R5 (43)	8.85
SparrowsPt. B2 (43)	8.65
Struthers,O. Y1 (43)	8.55
Worcester,Ja. T6 (43)	8.85

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, MD Spring, High Carbon

Aliquippa,Pa. J5 (43)	6.25
Alton,Ill. L1 (43)	6.55
Bartonville,Ill. K4	6.64
Buffalo W12 (43)	6.25
Cleveland A7 (43)	6.25
Donora,Pa. A7 (43)	6.25
Duluth,Minn. A7 (43)	6.25
Fostoria,O. S1 (43)	6.25
Johnstown,Pa. B2 (43)	6.25
Millbury(12) N6 (43)	8.05
Minnequa,Colo. C10(43)	6.50
Monessen,Pa. P7 (43)	6.25
Monessen,Pa. P16	6.75
Muncie,Ind. I-7 (43)	6.45
Palmer,Mass. W12(43)	6.55
Pittsburg,Calif. C11(43)	7.20
Roebling,N.J. R5 (43)	6.55
Portsmouth,O. P12(43)	6.25
So.Chicago,Ill. R2 (43)	6.25
So.SanFran. C10 (43)	7.20
SparrowsPt.,Md. B2 (43)	6.35
Struthers,O. Y1 (43)	6.25
Trenton,N.J. A7 (43)	6.55
Waukegan,Ill. A7 (43)	6.25
Worcester A7, T6 (43)	6.55
Worcester,Mass. W12(43)	6.55
Worcester,Mass. J1 (43)	6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.275
Alton,Ill. L1	6.50
Buffalo W12	6.275
Cleveland A7	6.275
Donora,Pa. A7	6.275
Duluth,Minn. A7	6.275
Johnstown,Pa. B2	6.275
LosAngeles B3	7.225
Minnequa,Colo. C10	6.525
Monessen,Pa. P7	6.275
Monessen,Pa. P16(42)	6.40
NewHaven,Conn. A7	6.575
Palmer,Mass. W12	6.375
Pittsburg,Calif. C11	7.225
Portsmouth,O. P12	6.275
Roebling,N.J. R5	6.375
So.Chicago,Ill. R2	6.275
So.SanFrancisco C10	7.225
SparrowsPoint,Md. B2	6.375
Torrance,Calif. C11	7.225
Trenton,N.J. A7	6.375
Waukegan,Ill. A7	6.275
Worcester,Mass. A7	6.375

WIRE, Fine & Weaving (8 Coils)

Alton,Ill. L1 (44)	9.20
Bartonville,Ill. K4	9.42
Buffalo W12 (43)	8.90
Chicago W13	9.32
Cleveland A7 (43)	8.90
CrawFsville,Ind. MS(43)	8.90
Fostoria,O. S1 (43)	8.90
Johnstown,Pa. B2 (43)	8.90
Kokomo,Ind. C16 (43)	8.90
Monessen,Pa. P16 (43)	8.90
Muncie,Ind. I-7 (43)	9.10
Palmer,Mass. W12 (43)	9.20
Roebling,N.J. R5 (43)	9.20
Waukegan,Ill. A7 (43)	8.90
Worcstr,Mass. A7,T6(43)	9.20

WIRE, Tire Bead

Bartonville,Ill. K4	11.51
Monessen,Pa. P16 (43)	11.40
Roebling,N.J. R5 (43)	11.50

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2	135
Ala.City,Ala.,17-19½ga. R2	222
Aliqu'pa,Pa.9-14½ga.J5	139‡
Atlanta A11	140
Bartonville,Ill.(19) K4	137
Crawfordsville,Ind. MS	138
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Houston,Tex. S5	145
Johnstown,Pa. B2	138
Johnstown 17ga.,6" B2	225
Joliet,Ill. A7	133
KansasCity,Mo. S5	149
Kokomo,Ind. C16	140
Minnequa,Colo. C10	146*
Monessen,Pa. P7	138
Pittsburg,Calif. C11	156
Rankin,Pa. A7	133
So.Chicago,Ill. R2	135
Sterling,Ill. (1) N15	136

*On 14c zinc; ‡17.5c zinc.

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2	140
Duluth,Minn. A7	133
Franklin,Pa. F5	145
Huntington,W.Va. W7	148
Johnstown,Pa. B2	148
Marion,O. P11	140
Minnequa,Colo. C10	138
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	144
Aliquippa,Pa. J5	148‡
Atlanta A11	149
Bartonville,Ill.(19) K4	146
Crawfordsville,Ind. MS	147
Donora,Pa. A7	142
Duluth,Minn. A7	142
Fairfield,Ala. T2	142
Houston,Tex. S5	154
Johnstown,Pa. B2	145
Joliet,Ill. A7	142
KansasCity,Mo. S5	158
Kokomo,Ind. C16	149
Minnequa,Colo. C10	153*
Monessen,Pa. P7	147
Pittsburg,Calif. C11	162
Rankin,Pa. A7	142
So.Chicago,Ill. R2	144
So.SanFran.,Calif. C10	167*
SparrowsPoint,Md. B2	147
Sterling,Ill.(1) N15	145

*Based on 14c zinc; ‡17.5c zinc.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	132
Atlanta A11	134
Bartonville,Ill.(19) K4	132
Crawfordsville,Ind. MS	132
Donora,Pa. A7	132
Duluth,Minn. A7	132
Fairfield,Ala. T2	132
Joliet,Ill. A7	132
KansasCity,Mo. S5	144
Kokomo,Ind. C16	134
Minnequa,Colo. C10	137
Pittsburg,Calif. C11	156
So.Chicago,Ill. R2	132
So.SanFran.,Calif. C10	156
SparrowsPoint,Md. B2	134
Sterling,Ill.(1) N15	132

TRACK BOLTS (20) Treated

KansasCity,Mo. S5(46)	9.85
Lebanon,Pa. (31) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85

AXLES

Ind Harbor,Ind. S13	5.65
Johnstown,Pa. B2	5.65

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	127
Aliquippa,Pa. J5	127
Atlanta A11	130
Bartonville,Ill. (19) K4	127
Chicago,Ill. W13	127
Cleveland A7 (44)	125
Crawfordsville,Ind. MS	127
Donora,Pa. A7	127
Duluth,Minn. A7	127
Fairfield,Ala. T2	127
Galveston,Tex. I7	135
Houston,Tex. S5	135
Johnstown,Pa. B2	127
Joliet,Ill. A7	127
KansasCity,Mo. S5	139
Kokomo,Ind. C16	129
Minnequa,Colo. C10 (44)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11	146
Portsmouth,O. P12	132
Rankin,Pa. A7	127
So.Chicago,Ill. R2	127
SparrowsPt.,Md. B2	129
Sterling,Ill.(1) N15	127
Torrance,Calif. C11	147
Worcester,Mass. A7	133

STAPLES, Polished, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	126
Atlanta A11	129
Bartonville,Ill. (19) K4	126
Chicago W13	127
Crawfordsville,Ind. MS	128
Donora,Pa. A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
Kokomo,Ind. C16	128
Minnequa,Colo. C10 (45)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11	146
Portsmouth,O. P12	132
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
SparrowsPt.,Md. B2	128
Sterling,Ill.(1) N15	128
Torrance,Calif. C11	146
Worcester,Mass. A7	132

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.80
Wheeling W.Va. W10	7.80

TIE PLATES

Fairfield,Ala. T2	4.775
Gary,Ind. U5	4.775
Ind Harbor,Ind. I-2	4.775
Lackawanna,N.Y. B2	4.775
Minnequa,Colo. C10	$56.50*
Pittsburg,Calif. C11	4.925
Seattle B3	4.925
Steelton,Pa. B2	4.775
Torrance,Calif. C11	4.925

* Per net ton.

JOINT BARS

Bessemer,Pa. U5	4.925
Fairfield,Ala. T2	4.925
Ind Harbor,Ind. I-2	4.925
Joliet,Ill. U5	4.925
Lackawanna,N.Y. B2	4.925
Minnequa,Colo. C10	4.925
Steelton,Pa. B2	4.925

STANDARD TRACK SPIKES

Ind Harbor,Ind. I-2, Y1	6.65
KansasCity,Mo. S5	6.90
Lebanon,Pa. B2	6.65
Minnequa,Colo. C10	6.65
Pittsburgh J5	6.65
Seattle B3	7.15
So.Chicago,Ill. R2	6.65
Struthers,O. Y1	6.65
Youngstown R2	6.65

RAILS

	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	3.775	3.675	3.725	4.25
Ensley,Ala. T2	3.775	3.675		4.25
Fairfield,Ala. T2				4.25
Gary,Ind. U5	3.775	3.675	3.725	
Huntington,W.Va. W7				5.25
IndianaHarbor,Ind. I-2	3.775	3.675	3.725	
Johnstown,Pa. B2				(16)4.25
Lackawanna,N.Y. B2	3.775	3.675		4.25
Minnequa,Colo. C10	$75.50*	$73.50*		4.75
Steelton,Pa. B2	3.775	3.675		
Williamsport,Pa. S19				5.00

* Per net ton.

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.550
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	
18	4	1	....	1.505
18	4	2	1.65-1.66	
20-25	4-5	1.6-1.2	2.5-3.5	3.67-
18	4	2	7	2.490
18-25	4-5	1	4.75	2.12-
18	4	2	9	2.445-2.4
13.5	4	3	....	1.662-
9	3.25	0.5	....	1.01

W	Cr	V	Mo	
6.4	4.5	1.9-5		0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include AL, A5, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

FOOTNOTES

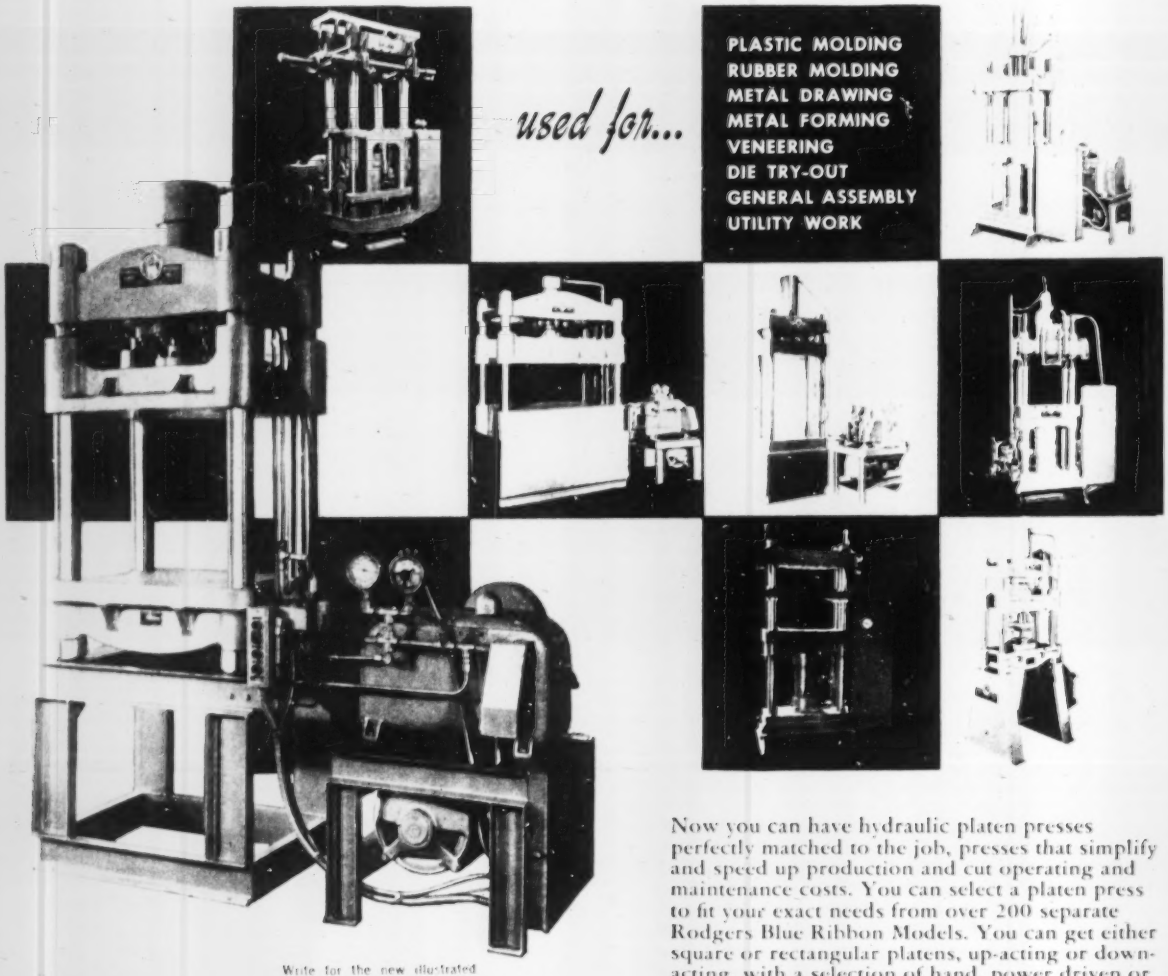
(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Chicago or Birm. base.
(6) To jobbers, 5 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(15) "S" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for unfrosted.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.20c, Steel than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.65c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Add $3.50 per ton.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.85c for cut lengths.
(35) 72" and narrower.
(36) 14" and narrower.
(37) 15 gage & lighter, 60" & narrower.
(38) 14 gage & lighter 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035", 0.075" and heavier, 0.25c higher.
(41) 9 lbs for cut lengths.
(42) Plus 0.375c per 100 lb.
(43) Plus 4.7½ on base and extras.
(44) Plus 4c per 100 lb.
(45) Plus 4c per 100 lb.
(46) Plus 2.2 per cent.
(26) Reinforcing, mill

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.-HighCarb Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Northwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P8 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhodesian Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.
S1 Seneca Wire & Mfg. Co.
S4 Sharon Steel Corp.
S4 Sharon Tube Co.
S6 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sivyer Steel Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T6 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
U4 Universal Cyclops Steel
U5 United States Steel Corp.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West Auto Mach. Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

Here's the new Rodgers blue ribbon line of platen presses designed for power, performance and economy on all types of production jobs!

- **POWER** — from 10 to 500 tons pressure!
- **PERFORMANCE** — for precision work on all types of materials!
- **ECONOMY** — simple, rugged design — easy to service!



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Write for the new illustrated Rodgers Blue Ribbon Catalog No. 320 giving complete specifications on 229 different models!

Now you can have hydraulic platen presses perfectly matched to the job, presses that simplify and speed up production and cut operating and maintenance costs. You can select a platen press to fit your exact needs from over 200 separate Rodgers Blue Ribbon Models. You can get either square or rectangular platens, up-acting or down-acting, with a selection of hand, power driven or combination pumps to suit your work.

HYDRAULICS KEEP THE WORLD MOVING

Rodgers Hydraulic, Inc.

7423 Walker St., St. Louis Park, Minneapolis 16, Minn. **HYDRAULIC POWER EQUIPMENT**

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
List Per Ft.	.24	.31	.42	.54	.74	1.05	1.36	1.64	2.16	3.53	5.09
Pounds Per Ft.	.245	.42	.568	.852	1.134	1.678	2.272	2.731	3.678	5.82	7.62

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J6 (c)	32	13	32	13	32	18	38	20	38	20	38	21	38	21	40	21	40	21
Aliquippa, Pa. J6 (e)	25	10	32	13	32	18	38	20	38	20	38	21	38	21	40	21	40	21
Aliquippa, Pa. J6 (f)	25	10	32	13	32	18	38	20	38	20	38	21	38	21	40	21	40	21
Aliquippa, Pa. J6 (g)	25	10	32	13	32	18	38	20	38	20	38	21	38	21	40	21	40	21
Benwood, W. Va. W10	32	13	32	13	32	18	38	20	38	20	38	21	38	21	40	21	40	21
Benwood, W. Va. W10 (c)	32	13	32	13	32	18	38	20	38	20	38	21	38	21	40	21	40	21
Butler, Pa. P6	32	13	32	13	32	18	38	20	38	20	38	21	38	21	40	21	40	21
Butler, Pa. P6 (c)	32	13	32	13	32	18	38	20	38	20	38	21	38	21	40	21	40	21
Elba, Pa. N2 (c)	32	13	32	13	32	18	38	20	38	20	38	21	38	21	40	21	40	21
Elba, Pa. N2 (e)	32	13	32	13	32	18	38	20	38	20	38	21	38	21	40	21	40	21
Fontana, Calif. K1 (c)	15	0	25	0	25	5	25	7	25	7	25	8	26	8	27	8	27	8
Fontana, Calif. K1 (e)	15	0	25	0	25	5	25	7	25	7	25	8	26	8	27	8	27	8
Ind. Harbor, Ind. Y1 (c)	31	14	31	14	31	18	37	21	37	21	38	22	38	22	39	21	39	21
Ind. Harbor, Ind. Y1 (e)	31	14	31	14	31	18	37	21	37	21	38	22	38	22	39	21	39	21
Lorain, O. N3 (c)	32	22	32	22	32	26	38	28	38	28	38	27	38	28	40	26	40	26
Lorain, O. N3 (e)	32	22	32	22	32	26	38	28	38	28	38	27	38	28	40	26	40	26
Sharon, Pa. M6	32	14	32	14	32	18	38	21	38	21	38	20	38	21	40	20	40	20
Sharon, Pa. M6 (c)	32	14	32	14	32	18	38	21	38	21	38	20	38	21	40	20	40	20
Sparrows Pt., Md. B2	30	11	32	13	32	16	38	18	38	18	38	17	38	18	40	18	40	18
Youngstown, R2 (c)	32	16	32	16	32	20	38	24	38	24	38	23	38	24	40	24	40	24
Youngstown, Y1 (c)	32	13	32	13	32	18	38	22	38	22	38	22	38	22	40	22	40	22
Wheatland, Pa. W9	32	13	32	13	32	16	38	18	38	18	38	19	38	18	40	20	40	20

SEAMLESS STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	2	2½	3	3½	4	5	6
List Per Ft.	.536	.776	1.064	1.455	$1.80	$1.48	$1.92
Pounds Per Ft.	3.68	5.82	7.62	9.20	10.89	14.81	18.78

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J6 (c)	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Ambridge, Pa. N2	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Lorain, O. N3 (c)	24	12.75	27	12.75	27	12.75	29	14.75	29	14.75	33.75	19.5	33.75	19.5
Youngstown, Y1 (c)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

ELECTRIC WELD STANDARD PIPE, T & C

Lone Star, B2 (c)	24	8.25	27	9.75	27	9.75	29	11.75	29	11.75	33.75	16.5	33.75	16.5

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛	¼	⅜	½	¾	1	1¼	1½	2
List Per Ft.	.536	.74	.96	1.28	1.70	2.42	3.12	3.77	$4.99
Pounds Per Ft.	.24	.42	.57	.85	1.13	1.68	2.28	2.73	3.68

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Benwood, W. Va. W10	29.5	9.25	23.25	3.5	17.75	7.25	33	14.25	33	14.25						
Butler, Pa. P6 (c)	30.5	1.25	25	1.75	20	3.5										
Elba, Pa. N2 (c)	30.5	1.25	25	1.75	20	3.5	33	14.25	33	14.25						
Sharon, Pa. M6 (c)	29.5	1.75	23	2.25	18	5.25										
Sharon, Pa. S1 (c)	30.5	1.25	25	1.75	20	3.5										
Sparrows Pt., Md. B2	28.5	0.75	23	3.75	18	7.50										
Youngstown, R2 (c)							33	15.75	33	15.75						
Wheatland, Pa. W9	28.5	0.75	23	3.75	18	7.50										

Galvanized pipe discounts based on zinc price of: (c), 11c; (e), 12.5c; (f), 11.5c; (g), with discounts adjusted depending on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft., mill; minimum wall thickness, cut lengths 10 to 24 ft., inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	14.19	16.71-17.77	16.20	16.20
1¼	13	16.97	19.80-21.26	16.46	19.19
1½	13	18.22-18.77	22.08-22.82	18.19	21.41
1¾	13	20.35-21.35	24.92-25.49	20.69	24.35
2	13	22.81-23.93	27.94-28.58	23.19	27.28
2¼	13	25.69-26.66	31.38-32.18	25.84	30.42
2½	12	28.40-29.36	34.55-35.58	28.46	33.50
2¾	12	31.28-32.17	37.83-39.19	31.19	36.67
3	12	33.87-34.82	40.69-42.44	33.05	38.86
3½	12	35.78-36.87	42.11-44.93	34.98	40.82

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

⅜ in. and shorter	
½ in. & smaller diam.	15
½ in. & smaller	18
⅝ in. and larger	17
Longer than 6 in.	
All diams.	14
Lag bolts, all diams.	21
6 in. and shorter	23
Over 6 in. long	21
Rolled Necked Carriage	18
Blank	31
Pole	31
Step Elevator Top and Sleigh Shoe	21
Tire Bolts	21
Boiler & Fitting Up Bolts	31

NUTS

	Reg. Hvy.
H.P. & C.P. Sq.	
Square	
½ in. & smaller	15
⅝ in. & ¾ in.	12
⅞ in. & 1 in.	10
1⅛ in. & larger	7
H.P. Hex	
½ in. & smaller	26
⅝ in. & ¾ in.	22
⅞ in. & 1 in.	12
1⅛ in. & larger	8
C.P. Hex	
½ in. & smaller	26
⅝ in. & ¾ in.	22
⅞ in. & 1 in.	17
1⅛ in. & larger	12

SEMIFINISHED NUTS

American Standard

	Reg.	Hvy.
(Per cent off list for less than case or keg quantities)		
½ in. & smaller	35	28.5
⅝ in. & ¾ in.	29.5	22
⅞ in. & 1 in.	24	15
1⅛ in. & larger	15	8.5
	Light	
½ in. & smaller	35	17 to 20
⅝ in. to ¾ in.	30	24
⅞ in. to 1 in.	26	

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged, per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged, per cent off list)

6 in. or shorter:	
⅝-in. & smaller	42
¾ in. through 1 in.	34
Longer than 6 in.:	
⅝-in. and smaller	26
¾-in. through 1 in.	4

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger	7.85c
½-in. under	36 off

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plants)

GRAPHITE

Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95

CARBON

35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsv. fur.	$11.50-12.00
Connellsv. fdy.	16.50-17.00
New River foundry	20.50
Wise county foundry	15.50
Wise county, furnace	15.50

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$24.00
Everett, Mass. ovens	
New England, del.	26.65
Chicago ovens	24.00
Chicago, del.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	24.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	25.85
Painesville, O., ovens	25.00
Cleveland, del.	27.43
Erie, Pa., ovens	24.00
Birmingham, ovens	21.65
Cincinnati, del.	26.25
LoneStar, Tex., ovens	18.00
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis, del.	26.00
Portsmouth, O., ovens	24.00
Cincinnati, del.	26.62
Detroit, ovens	25.00
Detroit, del.	26.50
Buffalo, del.	28.08
Flint, del.	28.23
Pontiac, del.	27.00
Saginaw, del.	28.58

Or within $1.25 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens	
Pure benzol	30.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.00
Per ton, bulk, ovens	
Sulphate of ammonia	$11.45
Birmingham area	$19.00
Cents per pound, ovens	
Phenol, to resellers, non-returnable drums	17.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, Ill., Ky.	
net tons, railroads, effective	
CaF_2 content, 70%	$33.60; $30
Imported net ton, duty paid, metallurgical grade	$30-$35

NOTE: Current prices on clad steels appeared on page 131 Mar. 24 issue.

STAINLESS STEEL

(Add 1.7% to extras where new extra cards have not been issued)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	44.25	36.50	33.75
302	44.50	36.75	34.00
303	46.50	43.50	36.50
304	46.50	41.75	35.50
305	60.50	50.25	48.25
316	61.50	63.50	52.00
321	53.00	52.00	40.00
347	58.00	56.50	44.25
410	39.00	32.25	27.50
416	40.00	40.00	28.00
420	47.00	50.25	33.50
430	41.50	33.25	28.00
501	29.25	27.75	14.25

Bar: Types 301,347 and 430 sheets except 301 and 302 B2.

Brackenridge, Pa. sheets Al quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip T4

Butler, Pa. sheets and strip except Types 301, 302, 316, 420, 501 & 502, A10

Carnegie, Pa., sheets and strip except Types 301, 416, 501 & 502 S18

Cleveland, strip A7

Detroit, strip M1 quotes 34.00c on Type 301, 36.00c on 302, 38.00c, 304, 45.00c, 316, 52.00c, 347, 50.00c, 410, 31.00c, 430

Dunkirk, N. Y., bars, wire A1 quotes slight variations on Types 301-347

Duquesne Pa., bars U1

Fort Wayne, Ind., bars and wire except Types 501 & 502 J6 quotes slight variations on Types 301-347

Gary, Ind., sheets except Type 416 U1

Harrison, N. J., strip and wire C15

Harrison, N. J., wire Type 302—37.00c; Type 304—34.50c; Type 316—41.00c, including 4.7% increase on base price

Massillon, O., all items, R2

McKeesport, Pa., strip Type 410, bars & wire Types 410 through 420 and 51 Zr on Type 302—33.75c on 302 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 E2

McKeesport, Pa., bars, sheets except Type 416 U1

Middletown, O., sheets and strip except Types 301, 416, 420, 501 and 502 A10

Midland, sheets & strip C15

Munhall, Pa., bars U1

Muncie, Ind., wire I-7 quotes Types 302, 304, 430

Pittsburgh, sheets C15

Reading, Pa., strip except 34.25c on Type 301 and 36.00c on 302; bars except 41.50c on Type 301 and 43.25c on 302 C4

Sharon, Pa., strip except Types 301, 302, 416, 501, 502 and 34.25c on Type 301 S2

So. Chicago, Ill., bars & structurals U5

Syracuse, N. Y., bars, wire & structurals C15

Titusville, Pa., bars U1

Wallingford, Conn., strip W2 quotes 0.2c higher

Washington, Pa., bars, sheets & strip except 0.25c high-er on Type 301 J4

Washington, Pa., Types 301 through 347 sheets & strip except 301, 302, 316 sheets 62.00c, strip 64.00c W4

Watervliet, N.Y., structurals & bars A1 quotes extra-tions on Types 301-347

Wauregan, bars & wire A7

West Leechburg, Pa., strip A1 quotes slight variations on Types 301-347

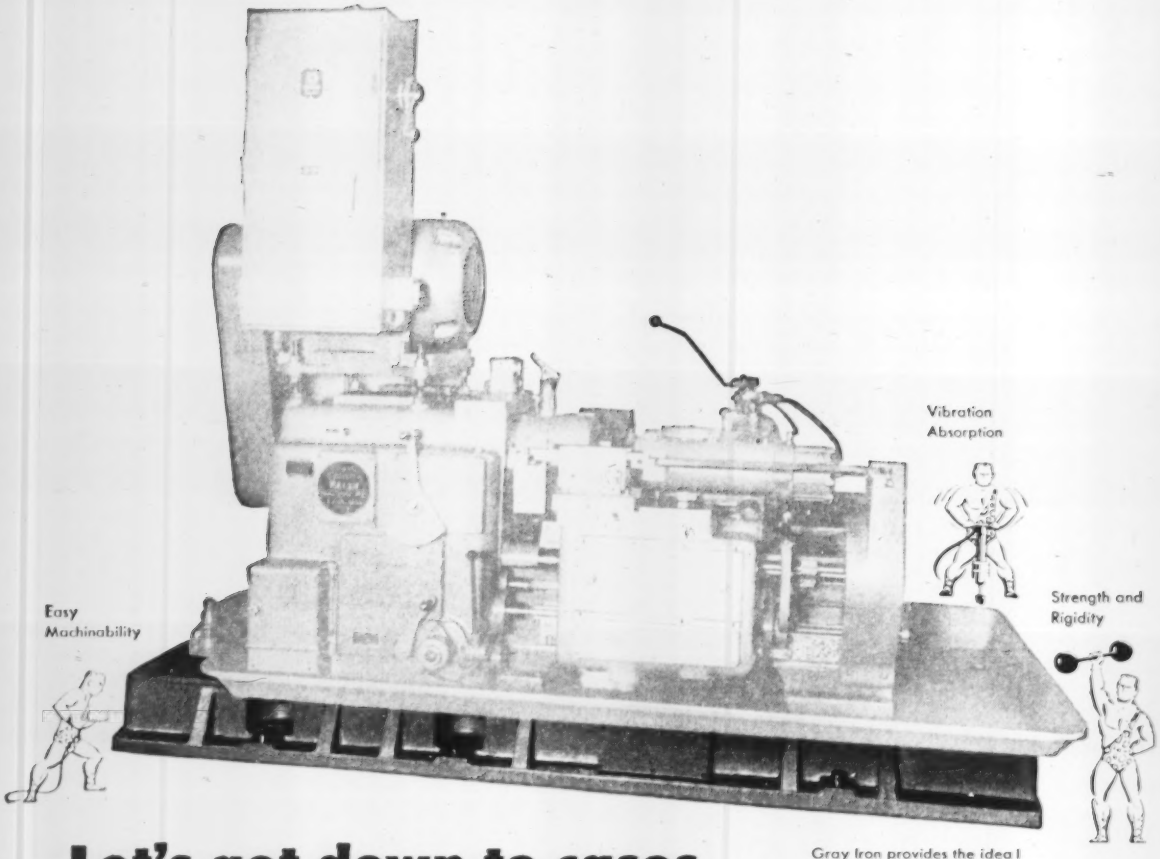
Youngstown, strip except Types 301, 302, 316, 416, 501 and 502 and 34.25c on Type 301 C5

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as other-wise noted)

Sponge iron	Cents
98.5% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.l.f. N.Y. c.l., in bags	10.00
Electrolytic iron	
Annealed 99.9% Fe	42.50
Unannealed 99% Fe	36.50
Unannealed 99.5% Fe, minus 325 mesh	51.00
Powder Flakes	48.00
Carbonyl iron	
97.9-99.5% size 5 to 10 microns	$3.00-$18.00
Aluminum	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	33.00
Antimony, 500 lb lots	74.00
Brass, 20 ton lots	31.00-34.25
Bronze, 10 ton lots	51.25-60.00
Phosphor Copper, 20 ton lots	50.00
Copper	
Electrolytic	17.25
Reduced	15.25
Lead	7.00*
Magnesium	75.00-85.00
Manganese	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver 5 ton lots	46.00
Silicon	38.00
Solder	50*
Stainless Steel, 302	85.00
Zinc, 10 ton lots	31.00
Tungsten	Dollars
Melting grade 99% 90 to 200 mesh	4.50
1000 lb and over	4.75
Less than 1000 lb	6.00
Molybdenum 99.9% minus 200 mesh	3.24
Chromium, electrolytic 99.9% fr. min.	3.00

*Plus cost of lead.



Gray Iron provides the ideal combination of characteristics for the base of this automatic lathe.

Let's get down to cases ABOUT BASES!

GRAY IRON
Characteristics Include:

- Castability
- Low Notch Sensitivity
- Heat Resistance
- Durability
- Machinability
- Rigidity
- Wear Resistance
- Corrosion Resistance
- Vibration Absorption
- Wide Strength Range

The manufacturer of this automatic lathe had previously used a fabricated steel base. To cut down delivery time and reduce costs, a switch was made to a cast Gray Iron base.

In the manufacturer's own words . . . "in addition to appreciable cost savings, delivery time to our machine shop is about one-eighth that of fabricated steel. Because of the rigidity inherent in the casting, we have a base which is easy to machine, absorbs vibration, and does the kind of a job our customers expect."

When you "get down to cases" about machine tool bases—or any other application requiring the unique combination of advantages listed at the left—be sure to investigate Gray Iron! Write for technical information on the many advantages of the Gray Iron casting process.

Make it Better with Gray Iron • **Second largest industry in the Metal-working field**

GRAY IRON FOUNDERS' SOCIETY, INC.

NATIONAL CITY-E. 6th BLDG., CLEVELAND 14, OHIO

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents, Philadelphia, 25 cents; Birmingham, Cincinnati, San Francisco, St. Paul, 15 cents.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††*		Carbon	Floor
Baltimore	5.81	7.17	8.32	6.42	...	6.41	7.18	11.17	6.47	6.47	7.70
Boston	6.51	7.35	8.39	6.55	...	6.42	7.40	12.37	6.56	6.50	7.98
Buffalo	5.80	6.65	8.31	6.21	...	5.90	6.95	11.07	6.08	6.30	7.67
Birmingham	5.80	6.65	7.70[2]	5.80	...	5.80	7.85	...	5.95	6.10	8.15
Chicago	5.80	6.65	7.90	5.83	...	5.83	6.80	10.65	5.95	6.00	7.18
Cincinnati	6.08	6.67	8.16	6.09	...	6.08	7.11	11.02	6.37	6.42	7.55
Cleveland	5.80	6.65	8.04	6.00	...	5.80	6.90	10.79	6.28	6.17	7.51
Detroit	6.23	6.46	8.44	6.08	7.495	6.12	7.10	10.92	6.42	6.47	7.52
Houston	6.74	...	8.67	6.89	...	6.98	...	...	6.82	6.78	8.16
JerseyCity,N.J.	6.26	7.27	8.32	6.56	...	6.59	7.53	9.54	6.39	6.60	8.01
Los Angeles	6.60	8.45	9.50	6.75	11.20	6.60	8.65	12.05	6.60	6.70	8.90
Milwaukee	5.97	6.82	8.07	6.00	...	6.00	7.07	10.82	6.12	6.17	7.35
Moline, Ill.	6.16	7.00	8.30	6.19	...	6.18	6.91	...	6.30	6.30	...
New York	6.26	7.37	8.32	6.56	...	6.60	7.63	11.14	6.49	6.70	8.11
Norfolk, Va.	7.60	...	...	...	...	6.44	8.70	...	7.25	6.64	7.33
Philadelphia	6.16	7.18	7.70	6.50	8.30	6.47	7.50	10.80	6.22	6.28	7.42
Pittsburgh	5.80	6.65	7.90	5.97	...	5.83	6.90	10.65	5.95	6.00	7.18
Portland, Oreg.	7.80	9.05	9.75	7.60	...	7.35	9.40	...	7.30	7.30	9.25
Richmond, Va.	6.14	6.95	8.88	6.53	...	6.30	7.63	...	6.58	6.68	7.80
St. Louis	6.10	6.94	8.20	6.14	...	6.13	7.20	10.95	6.35	6.40	7.58
St. Paul	6.47	7.31	8.61	6.50	...	6.49	7.32	...	6.61	6.61	7.84
San Francisco	6.85	8.15	9.45	6.70	...	6.60	8.65	12.00	6.45	6.70	8.85
Seattle-Tacoma	7.30	8.24	9.40	7.40	...	7.08	9.37	12.00	6.83	7.10	9.10
Spokane (city)	7.80	9.40	10.15	7.15	...	7.10	9.70	11.90	7.00	7.10	9.15
Washington	6.31	7.61	8.90	6.89	...	6.90	8.03	...	6.93	6.95	8.17

Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes 25-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [3]—500 to 1499 lb; [5]—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

(Prices effective for ore delivered up to and including June 30, 1953, gross ton, 51.50% iron natural, rail or vessel, lower lake ports.)

Old range bessemer	$10.10
Old range nonbe semer	9.95
Mesabi bessemer	9.85
Mesabi nonbessemer	9.70
Open-hearth lump	10.95
High phosphorus	9.70

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect on Dec. 31, 1952, and increases or decreases after such date for buyer's account.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Iron Ore

Cents per unit c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	22.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.21 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 90c-93c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00
South African Transvaal	
44% no ratio	$27.00-$28.00
48% no ratio	34.00-35.00
Brazilian	
44% 2.5:1 lump	nom. $32
Domestic	
(Rail nearest seller)	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates, per lb molybdenum content, mines	$1.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89.00; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $99.30; Salina, Pa., $104.55; Niles, O., $109; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $99.30; Hays, Pa., $105.10; Niles, O., $107; E. Chicago, Ind., Joliet, Rockdale, Ill., $109.70; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $179.55; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $186.90.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $69.30; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $92.40; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $127; Johnstown, Pa., $127.30; Clearfield, Pa., $135; St. Louis, $138; Athens, Tex., $140.90.

Nozzles

Reesdale, Pa., $203.20; Johnstown, Pa., $208.40; Clearfield, Pa., $219.45; St. Louis, $224.65; Athens, Tex., $225.20.

Runners

Reesdale, Pa., $158.20; Johnstown, Pa., $161.70; Clearfield, Pa., $168.60; St. Louis, $170.30; Athens, Tex., $174.40.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $166.30; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $210.20; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $244.85; Danville, Ill., $247.85; Clearfield, Pa., $252.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 10.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packed 13.45c, ton lot 14.25, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—weighing approx 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

Note: Current prices on chromium, silicon, vanadium, boron and tungsten alloys appeared on page 133, Mar. 23 issue, manganese and titanium alloys and "other" ferroalloys, page 183, Mar. 16.

IRON AND STEEL SCRAP

Open market prices as reported to STEEL, Mar. 26, 1963, gross tons, except as noted. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Mar. 26	$44.17
Mar. 19	44.17
Feb. 1953	43.00
Mar., 1952	43.00
Mar., 1948	40.21

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Including brokers' commission)

No. 1 heavy melting	44.00*
No. 2 heavy melting	*42.00**
No. 1 bundles	*44.00**
No. 2 bundles	*40.00**
No. 1 bushelling	*44.00**
Machine shop turnings	30.00-31.00*
Mixed borings, turnings	*32.00-34.00**
Short shovel turnings	*32.00-34.00**
Cast iron borings	*32.00-34.00**
Cut structurals	40.00-41.00*
Heavy turnings	44.00*
Punchings & plate scrap	*40.00-42.00**
Electric furnace bundles	46.00*

Cast Iron Grades

(Delivered)

No. 1 cupola	47.00-48.00
Charging box cast	45.00-46.00
Heavy breakable cast	44.00-45.00
Unstripped motor blocks	*44.00-45.00*
No. 1 machinery cast	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt	47.00-48.00
Rails, 3 ft. and under	*48.00-50.00*
Rails, 18 in. and under	*50.00-60.00*
Rails, random lengths	*54.00-57.00*
Railroad specialties	50.50-56.50

*Plus applicable freight springboards from other areas.

CLEVELAND

(Delivered consumer plant, including broker's commission)

No. 1 heavy melting	44.00-44.50*
No. 2 heavy melting	*42.00-42.50**
No. 1 bundles	44.00-44.50*
No. 2 bundles	*40.00-40.50**
No. 1 bushelling	44.00-44.50*
Machine shop turnings	30.00-31.00*
Mixed borings, turnings	*32.00-34.00**
Short shovel turnings	*32.00-34.00**
Cast iron borings	*32.00-34.00**
Low phos.	49.00-50.00*
Alloy free, short shovel turnings	37.00-38.00*
Electric furnace bundles	46.00-46.50*

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	46.00-47.00
Stove plate	45.00-46.00
Heavy breakable cast	44.00-45.00
Unstripped motor blocks	38.00-38.50
Brake shoes	40.00-41.00
Clean auto cast	52.00
No. 1 wheel	46.00-47.00
Burnt cast	40.00-41.00
Drop broken machinery	49.00

Railroad Scrap

No. 1 R.R. heavy melt	46.00-47.00
R.R. Malleable	50.00-51.00
Rails, 3 ft. and under	48.00-50.00
Rails, 18 in. and under	51.00-52.00
Rails, random lengths	56.00
Cast steel	51.00-52.00
Railroad specialties	51.00-52.00
Uncut tires	52.00-53.00
Angles, splice bars	54.00-55.00
Rails, rerolling	56.00

*Plus applicable freight springboards from other districts.

YOUNGSTOWN

(Delivered consumer plant, including broker's commission)

No. 1 heavy melting	44.00-44.50*
No. 2 heavy melting	*42.50-43.00**
No. 1 bundles	45.00-45.50*
No. 2 bundles	*39.50-40.00**
Machine shop turnings	31.00-32.00*
Short shovel turnings	*32.00-33.00**
Cast iron borings	*32.00-33.00**
Low phos.	50.00-51.00*
Electric furnace bundles	47.00-47.50*

Railroad Scrap

No. 1 R.R. heavy melt	46.00-47.00

*Plus applicable freight springboards from other districts.

NEW YORK

(Brokers' Buying Prices)

No. 1 heavy melting	nominal
No. 2 heavy melting	35.00
Machine shop turnings	25.50
Mixed borings, short turnings	29.50
Low phos. (structural & plate)	*41.00-41.50*
Shovel turnings	29.50

Cast Iron Grades

No. 1 cupola	40.00
Unstripped motor blocks	32.00-33.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	46.00
No. 2 heavy melting	*41.00-42.00*
No. 1 bundles	46.00-47.00
No. 2 bundles	41.00
No. 1 bushelling	46.00
Machine shop turnings	32.00-33.00
Mixed borings, turnings	36.00-37.00
Short shovel turnings	36.00-37.00
Structurals & plate	46.00-47.00
Heavy turnings	46.00
Couplers, springs, wheels	52.00

Cast Iron Grades

No. 1 cupola	43.00-44.00
Charging box cast	44.00
Heavy breakable cast	46.50
Unstripped motor blocks	37.00-38.00
Drop broken machinery	50.00-51.00

CINCINNATI

(F.o.b. shipping point)

No. 1 heavy melting	41.35
No. 2 heavy melting	41.35
No. 1 bundles	42.35
No. 2 bundles	41.35
No. 1 bushelling	42.35
Machine shop turnings	32.35
Mixed borings, turnings	36.35
Short shovel turnings	36.35
Cast iron borings	36.35
Structural & plate, 1 ft	48.35

Cast Iron Grades

No. 1 cupola	*47.00*
Charging box cast	43.00
Stove plate	44.00
Burnt cast	41.00
Heavy breakable cast	38.00-40.00
Unstripped motor blocks	*37.00-38.00*
Brake shoes	41.00
Clean auto cast	*43.00*
Drop broken machinery	49.00-50.00

Railroad Scrap

(Delivered)

No. 1 R.R. heavy melt	*46.00-47.00*
Malleable	*49.00-50.00*
Rails, 18 in. and under	*59.00-60.00*
Rails, random lengths	*50.00*
Rails, rerolling	52.00

DETROIT

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	38.00-39.00
No. 1 bundles	40.00-41.00
No. 2 bundles	*35.00-36.00*
No. 1 bushelling	40.00-41.00
Machine shop turnings	24.00-25.00
Mixed borings, turnings	27.00-27.75
Short shovel turnings	27.00-27.75
Punchings & plate scrap	44.00-46.00

Cast Iron Grades

No. 1 cupola	47.50
Charging box cast	40.00-42.00
Stove plate	43.00-44.00
Unstripped motor blocks	33.00
Clean auto cast	50.00
Malleable	48.00

BUFFALO

No. 1 heavy melting	*$46.50-47.50*
No. 2 heavy melting	42.00-43.00
No. 2 bundles	42.00-43.00
No. 1 bundles	43.00-44.00
No. 1 bushelling	43.00-44.00
Machine shop turnings	32.50-33.00
Mixed borings, turnings	36.50-37.00
Short shovel turnings	36.50-37.00
Low phos	48.50-49.00

Cast Iron Grades

(F.o.b. Shipping Point)

No. 1 cupola	42.50-43.00
Drop broken machinery	45.50-46.00

BOSTON

(Brokers' Buying Prices; f.o.b. shipping points)

No. 1 heavy melting	34.17
No. 2 heavy melting	31.17
No. 1 bundles	34.17
No. 2 bundles	31.17
Machine shop turnings	22.17-23.17
Mixed borings, turnings	22.17
Short shovel turnings	26.17-27.17
No. 1 cast	34.00-35.00
Mixed cupola cast	32.00-33.00
No. 1 machinery cast	46.00-47.00

CHICAGO

(Including broker's commission)

No. 1 heavy melting	42.50*
No. 2 heavy melting	40.50*
No. 1 bundles	43.50*
No. 2 bundles	*38.50**
No. 1 bushelling	43.50*
Machine shop turnings	*27.00-28.00**
Mixed borings, turnings	*27.00-28.00**
Short shovel turnings	*29.00-30.00**
Cast iron borings	*27.00-28.00**
Cut structurals	46.50*
Heavy turnings	41.50*
Electric furnace bundles	45.50*

Cast Iron Grades

No. 1 cupola	43.00-45.00
Motor plate	*39.00-41.00*
Unstripped motor blocks	38.00-40.00
Clean auto cast	48.00-50.00
Drop broken machinery	46.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt	46.00-48.00
R.R. Malleable	46.00-48.00
Rails, 2 ft. and under	53.00-55.00
Rails, 18 in. and under	55.00-57.00
Angles, splice bars	52.00-54.00
Rails, rerolling	55.00-57.00

*Plus applicable freight springboards from other areas.

BIRMINGHAM

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	38.00-39.00
No. 1 bundles	39.00-40.00
No. 2 bundles	36.00-37.00
No. 2 bushelling	35.00-36.00
Machine shop turnings	28.00-29.00
Mixed borings, turnings	31.50-32.50
Short shovel turnings	31.50-32.50
Cast iron borings	31.50-32.50
Cut structurals	43.00-44.00
Heavy turnings	38.00
Punchings & plate scrap	41.50
Electric furnace bundles	41.00

Cast Iron Grades

(F.o.b. Shipping Point)

No. 1 cupola	43.00-44.00
Charging box cast	39.00-40.00
Stove plate	38.00-39.00
Heavy breakable cast	36.00-37.00
Unstripped motor blocks	35.00-36.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	47.00
Burnt cast	41.00
Drop broken machinery	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt	41.00
Malleable	55.00
Rails, 3-ft. and under	46.00
Rails, 18-in. and under	49.00
Rails, random lengths	49.00-51.00
Cast steel	44.00
Uncut tires	43.00
Angles, splice bars	46.00
Rails, rerolling	48.00

ST. LOUIS

(Brokers' Buying Prices)

No. 1 heavy melting	40.00
No. 2 heavy melting	40.00
Machine shop turnings	28.00
Short shovel turnings	*32.00*

Cast Iron Grades

No. 1 cupola	43.00-45.00
Charging box cast	39.00-41.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	33.00-35.00
Brake shoes	43.00
Clean auto cast	46.00-47.00
Burnt cast	37.00-39.00

Railroad Scrap

Malleable	40.00
Rails, 18 inch and under	60.00-62.00
Rails, random lengths	*50.00-52.00*
Uncut tires	*46.00-48.00*
Angles, splice bars	*48.00-49.00*
Rails, rerolling	*50.00*

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	29.00
No. 2 bundles	24.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Short shovel turnings	15.00
Electr. furnace, No. 1	*40.00-41.00*

Cast Iron Grades

(F.o.b. Shipping Point)

No. 1 cupola	40.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	28.41
No. 1 wheels	47.00

Railroad Scrap

Rails, random lengths	38.41

SAN FRANCISCO

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	29.00
No. 2 bundles	24.00
No. 1 bushelling	30.00
Machine shop turnings	12.00
Mixed borings, turnings	29.00
Short shovel turnings	29.00
Cast iron borings	29.00
Cut structurals	38.00
Heavy turnings	34.00
Punchings & plate scrap	37.50
Electric furnace bundles	37.00

Cast Iron Grades

No. 1 cupola	37.50
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast	45.00
Unstripped motor blocks	41.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	47.00
Burnt cast	41.00
Drop broken machinery	52.00

Railroad Scrap

No. 1 R.R. heavy melt	37.00
Malleable	55.00
Rails, 3-ft. and under	42.00
Rails, 18-in. and under	45.00
Rails, random lengths	39.00
Cast steel	40.00
Uncut tires	39.00
Angles, splice bars	42.00
Rails, rerolling	44.00

LOS ANGELES

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	29.00
No. 2 bundles	24.00
Machine shop turnings	12.00

Cast Iron Grades

(F.o.b. Shipping Point)

No. 1 cupola	38.00-41.00

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.50
No. 1 Bundles	35.50
No. 2 Bundles	35.50
Mechanical Bundles	31.50
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	28.50
Rails, Remelting	35.50
Rails, Rerolling	38.50
Bushelling	28.00
Bushelling new factory:	
Prep'd	33.50
Unprep'd	31.50
Short Steel Turnings	28.50

Cast Iron Grades†

No. 1 Machinery Cast	50.00

† F.o.b. shipping point.

OLD CEILING BASE PRICES

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Grade 1 Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Cortesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00

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For many years, leaders of U. S. industry have depended upon Galland-Henning Balers and Galland-Henning Counsel for profitable solution of their sheet metal salvage problems. If your plant generates an appreciable volume of sheet metal scrap per day, chances are that a G-H Baler of proper size and capacity will prove a profitable investment for you.

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The Metal Market

The month of March is doing a lot to clarify the trend of the nonferrous metal market. Copper is deemed adequate in supply and the price seems destined to settle at 30 cents

NO LIONS and lambs parallel can be found in March metal markets. The month is ending with only slightly diminished rush and roar that marked its beginning.

As April nears to wind up a month of activity unmatched in years, buyers, sellers and fabricators have a better idea of market direction and trend. In copper, supply is deemed adequate; price is still firm but ultimately due to slide to about 30 cents. One indication that the one-price level will be about there comes from Phelps-Dodge advancing its selling price from 28.50 to 30 cents.

Aluminum shows surprising price stability that's paying off on producers' order books. Scattered rises in aluminum products appear to be the only offshoot of decontrol coming. Zinc and lead have ceased wending their weary way downward, show signs of strengthening during April. In CMP metals (steel, copper and aluminum), unrated orders can be placed now for delivery after June 30, when DMS goes into effect.

Musical Chairs The market spotlight still plays strongest on copper, where buyers play a grim game of musical chairs. Every fabricator naturally wants to get his allocation in low-priced domestic copper; if he can't do that he turns to custom smelters and finally to top-price foreign copper sellers. A floating report has it that one purchasing agent filled his April allocation entirely in domestic copper and was forthwith elevated to a vice-presidency.

April supply of domestic copper (estimated at about 80,000 tons of the 135,000 tons allocation) was mostly snapped up in a few hours after tickets were received. Some primary producers and custom smelters limit sales to regular customers, ration on the basis of recent average purchase or post a waiting list. Nobody wants to be holding the bag that gets only foreign copper. Full amount allocated for April probably won't be taken up because of price uncertainty and because no one will build stocks at prevailing prices. February statistics show a higher daily consumption than January, a 10,500-ton gain in new bookings and a dip in reserves of nearly 10,000 tons.

Honey Brings Flies Fancy U. S. copper prices are attracting foreign suppliers like flies. Metal from companies that haven't traded here for decades is on its way. Northern Rhodesia, Belgian Congo, Germany, Turkey and Yugoslavia have been added to the list of today's sources.

Nonferrous scrap in hands of refiners and ingot makers is now plentiful except for No. 1 copper, and limits on daily intake are common. Most dealers' stocks are low: They got rid of hoarded metal when the market broke and are now unloading as soon as they take it in. March statistics on scrap activity promise to break all existing records. Brass mills hail relaxing of controls on quantity scrap purchases and retention of quality controls. It means they'll have less trouble getting needed grades in bulk which will reduce primary copper needed.

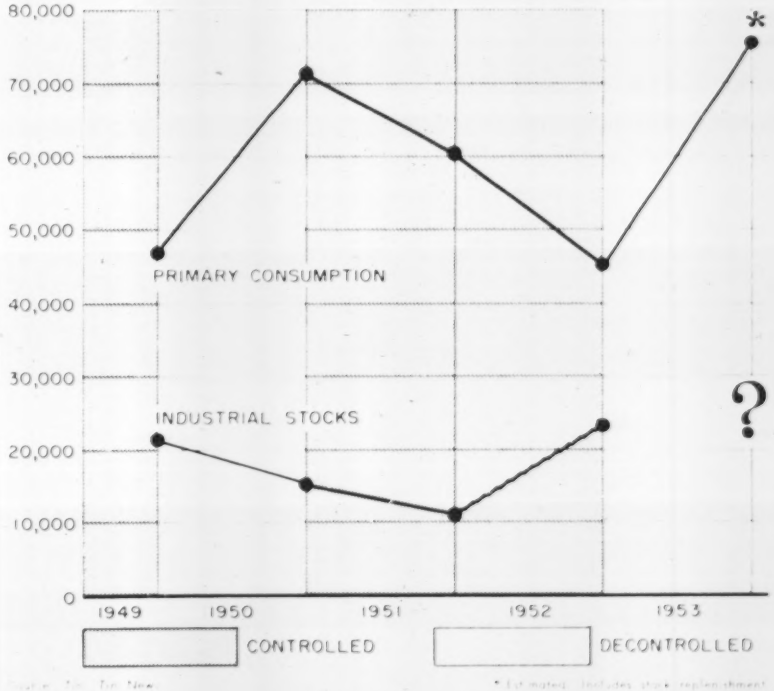
Brass Mill Products Tight

Brass mill products are extremely tight and promise to remain so till at least the third quarter. So says Herbert Barchoff, executive vice president, Eastern Brass & Copper Co., New York. Here's how he sizes up the next few months: Mill deliveries are generally running two to three months, about a month beyond normaley. Mills will be going full tilt through June, and after knocking off for the customary two weeks' vacation in July, won't have much trouble filling July order books. In August, holloware, giftware and toy makers start booming for the Christmas trade and generally continue into November.

"Warehouse stocks in general are very good," says Mr. Barchoff. Extended mill deliveries, discouragement of mill orders under 500 pounds and refusal to accept orders under 100 pounds has forced a lot of people to deal with distributors instead of mills. Eastern has noted little buyer resistance since decontrol and thinks transition to free buying will be smooth because no one has suffered from lack of brass for the past 3 to 6 months. Busiest customers today are electronics, appliance and office machinery fields.

TIN: BIG DAY COMING

U.S. Primary Tin Requirements—Long Tons



NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 27.50-34.50, Conn. Valley; Lake 32.12½ delivered.

Brass Ingots: 85-5-5-5 (No. 115) 29.50c; 88-10-2 (No. 215) 41.75c; 80-10-10 (No. 305) 35.00c; No. 1 yellow (No. 405) 24.00c.

Zinc: Prime western 11.00; brass special 11.25c; intermediate 11.50c; East St. Louis; high grade 12.50c; and special high grade 12.50c, delivered.

Lead: Common 13.50c; chemical 13.40c; corroding 13.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 20.50c, pigs 19.50c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 24.00-24.50; 95-5 remelt alloy (No. 2 grade) 21.00-21.00; steel deoxidizing grades, notch bars, granulated or shot (Grade 1) 24.00-25.50, grade 2, 23.00-24.00, grade 3, 22.50-23.50, grade 4, 22.00-23.00.

Magnesium: Commercially pure (99.8%+) standard ingots, 10,000 lb and over 27.00c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American, 99-99.8% and over but not meeting specifications below 34.50c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 35.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 60.00c; 25-lb pigs, 62.65c; "XX" nickel shot, 63.65c; "F" nickel shot or ingots, for addition to cast iron, 60.00c. Prices include import duty.

Mercury: Open market, spot, New York, $190-$205 per 76-lb flask.

Beryllium Copper: 2.75-4.25% Be, $37.72 per lb of contained beryllium, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2 del; special or patented shapes $2.15.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 85.25c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $175-185 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Cents per pound, f.o.b. mill, effective Feb. 25, 1953. Listings are lowest quotations.)

Sheet: Copper 48.98; yellow brass 42.03; commercial bronze 90% 48.49; 95% 47.46; red brass 85% 45.91; 80% 44.89; best quality 43.86; nickel silver 18% 58.52; phosphor-bronze grade A, 5% 68.57.

Rod: Copper, hot rolled 45.33; cold-drawn 46.58; yellow brass free cutting 35.92, commercial bronze 90% 48.18, 95% 47.15; red brass 85% 45.60, 80% 44.58.

Seamless Tubing: Copper 48.92; yellow brass 44.04; commercial bronze, 90% 50.02; red brass 85% 48.72.

Wire: Yellow brass 42.32; commercial bronze, 90% 48.33, 95% 47.74; red brass, 85% 46.20, 80% 44.18; best quality brass 43.78. (These prices effective Mar. 3, 1953.)

Copper Wire: Bare, soft, f.o.b. eastern mills, 10,000 lb to 19,999 lb del. 36.17; 1 to 5 tons 36.67. Weatherproof, 10,000 lb 36.75, 20,000 lb 37.00, 1 to 5 tons 37.50. Magnet Wire (c.l. 1,000 lb or more) 42.42, l.c.l. 42.23.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders. Effective Jan. 22, 1953.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	32.9	...	...
0.135-0.096	12-48	33.4	...	...
0.095-0.077	12-48	34.1	31.8	36.3
0.076-0.061	12-48	34.7	32.0	36.5
0.060-0.048	12-48	35.0	32.2	36.8
0.047-0.038	12-48	35.5	32.6	37.1
0.037-0.030	12-48	35.9	33.0	37.8
0.029-0.024	12-48	36.5	33.3	38.2
0.023-0.019	12-36	37.1	34.0	39.0
0.018-0.017	12-36	37.9	34.6	39.9
0.016-0.015	12-36	38.8	35.4	41.1
0.014	12-24	39.8	36.4	42.4
0.013-0.012	12-24	40.9	37.1	43.4
0.011	12-24	41.9	38.3	45.0
0.010-0.0095	12-24	43.1	39.4	46.6
0.009-0.0085	12-24	44.3	40.7	48.5
0.008-0.0075	12-24	45.8	41.9	50.3
0.007	12-18	47.3	43.4	52.6
0.006	12-18	48.9	44.8	57.6

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) of distance across flats	—Round— 178-T4	Hexagonal 178-T4
0.125	56.8	...
0.156-0.0188	48.0	...
0.219-0.313	45.3	...
0.375	43.7	52.4
0.406	43.7	...
0.438	43.7	52.4
0.469	43.7	...
0.500	43.7	52.4
0.531	43.7	...
0.563	43.7	49.2
0.594	43.7	...
0.625	43.7	49.2
0.688	43.7	49.2
0.750-1.000	42.6	46.4
1.063	42.6	44.8
1.125-1.500	41.0	44.8
1.563	40.5	...
1.625	39.8	43.2
1.688-2.000	39.8	...

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 110 sq ft or more $18.00 per cwt; add 50c cwt, 100 sq ft to 110 sq ft. Pipe: Full coils $18.00 per cwt. Traps and bends: List prices plus 43%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 20.75-21.75c; over 12-in., 26.75-21.75c.

"A" NICKEL

(Base prices f.o.b. mill, effective Mar. 9, 1953). Sheets, cold-rolled 86.50c. Strip, cold-rolled 82.50c. Rods and shapes 82.50c. Plates 84.50c. Seamless tubes 114.50c.

MONEL

(Base prices f.o.b. mill, effective Mar. 9, 1953). Sheets, cold-rolled 64.50c. Strip, cold-rolled 70.50c. Rods and shapes, 65.50c. Plates 66.50c. Seamless tubes, 100.50c. Shot and blocks, 57.00c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. to in diameter, less than 2½ lb 58.00-63.00c; 25 to 99 lb 48.00-52.00c; 100 lb to 5,000 lb, 44.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1953	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Mar. 13-26	27.50-34.50	13.50	11.00	121.50	20.50	34.50	60.00	85.25
Mar. 11-12	27.50-33.00	13.30	11.00	121.50	20.50	34.50	60.00	85.25
Mar. 2-10	27.50-32.00	13.30	11.00	121.50	20.50	34.50	60.00	85.25
Feb. 25-28	27.50-28.50	13.30	11.25	121.50	20.50	34.50	60.00	85.25
Feb. 3-24	24.50	13.30	11.50	121.50	20.50	34.50	60.00	85.25
Feb. 2	24.50	13.30	12.00	121.50	20.50	34.50	60.00	85.25
Jan. 27-31	24.50	13.80	12.00	121.50	20.50	34.50	60.00	85.25
Jan. 22-26	24.50	13.80	12.50	121.50	20.50	34.50	60.00	85.25
Jan. 16-21	24.50	13.80	12.50	121.50	20.00	34.50	60.00	85.25
Jan. 15	24.50	13.80	12.50	121.50	20.00	34.50	60.00	84.75
Jan. 14	24.50	13.80	12.50	121.50	20.00	34.50	60.00	84.25
Jan. 13	24.50	13.80	13.00	121.50	20.00	34.50	56.50	83.75
Jan. 12	24.50	13.80	13.00	121.50	20.00	34.50	56.50	83.25
Feb. 1953 Avg.	25.136	13.30	11.431	121.50	20.50	34.50	60.00	85.25
Jan. 1953 Avg.	24.50	13.838	12.596	121.50	20.173	34.50	58.654	84.442
Feb. 1952 Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9% base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled 42.15c; oval 41.65c.

Nickel Anodes: Rolled oval, carbonized, carloads 78.00c; 10,000 to 30,000 lb 79.00c; 3000 to 10,000 lb 80.00c; 500 to 3000 lb 81.00c; 100 to 500 lb 82.00c; under 100 lb, 86.00c; f.o.b. Cleveland.

Nickel Chloride: 37.35c in 100 lb bags, 1 to 3 bags, 3 to 99 bags 35.35c; 34.85c over 10,000 lb, f.o.b. Cleveland, freight allowed on 300 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers $1.10 per lb; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1000 lb, 69c; 2000 to 6000 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, $1.25; 100 lb kegs $1.26, f.o.b. Carteret, N. J.; freight allowed on 100 lb or more.

Scrap Metals

Brass Mill Allowances

(Prices in cents per pound for less than 15,000 pounds, f.o.b. shipping point. Listings are lowest quotations.)

	Clean Heavy	Rod Ends	Clean Turnings
Copper	27.125	27.125	26.375
Yellow Brass	20.625	20.375	19.500
Commercial Bronze			
90%	25.750	25.500	25.000
95%	24.875	24.625	24.125
Red Brass			
85%	24.000	23.750	23.250
80%	23.000	22.750	22.250
Best Quality (71-80%)	21.500	21.250	20.750
Muntz metal	19.375	19.125	18.625
Nickel silver, 10%	24.375	24.125	12.1875
Phos. Bronze, A	29.125	28.875	27.875
Naval Brass	19.25	19.00	18.50
Manganese Bronze	19.25	19.00	18.50

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 29.25; No. 2 copper 28.50-27.00 (all copper 25.00-25.50; refinery brass 19.00; copper in oily copper content 25.50.

INGOT MAKERS' COPPER AND BRASS SCRAP BUYING PRICES

(Carlots, delivered)

No. 1 copper, non 27.00; No. 2 copper, non 25.00; light copper, non 25.00c; No. 1 composition borings 22.00; No. 1 composition solids 22.00; radiators 16.50; heavy yellow brass solids, 17.00; yellow brass turnings 16.00.

SMELTERS' BUYING PRICES FOR SCRAP ALUMINUM

(Carlots, delivered)

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Steel Bars . . .

Bar Prices, Page 147

Cleveland — There is nothing in sight in the market to indicate any substantial lessening in demand for bars for months to come, especially the larger sizes. Military requirements for shells continue to absorb a large part of output and indications are shell needs will be even larger in second and third quarters. Meanwhile, requirements of the civilian goods industries, notably automotive, are expanding.

Boston — Where preliminary third quarter allocations have been made, reductions in cold-finished bar tonnage are indicated. Most bar grades over 1-inch will remain in limited supply. Small volume of cold-finished for June has moved without tickets. This is the first month in many when any space was open as lead-time approached.

New York — Because of the more extended lead time on alloy bars, sellers of this material have opened books for third quarter. They have done so, however, on a rather conservative basis, pending final word as to details of the program to succeed CMP.

Philadelphia — Hot carbon bar producers still confront more business than they can handle in second quarter. In effect they are out of the market until they open their books for the succeeding period.

Sheets, Strip . . .

Sheet and Strip Prices, Page 147 & 148

New York — More sheet conversion tonnage is being negotiated now than for months. There appears to be no question but what a considerable amount of this tonnage will be moving in third quarter, possibly beyond. Import market also reflects inability of buyers to obtain sufficient tonnage from regular mill suppliers, who are more than covered for the second quarter on major items. Hot and cold-rolled carbon sheets and electrical sheets and enameling stock are under special pressure. Possibility of higher prices some time in third quarter may be stimulating pressure to some extent, but the main consideration is to get steel, as indicated by the increasing amount of premium buying, some of which will not be reflected in actual shipments before mid-summer.

Philadelphia — Producers of sheets anticipate substantial carryover into third quarter. This will take precedence over unrated tonnage and it appears the new Defense Materials System cannot be made fully effective until possibly late in July. Also, mill operations will be retarded as a result of the vacation season.

Pittsburgh — Allegheny Ludlum Steel Corp. has received a certificate of necessity allowing quick amortization of 50 per cent of a $330,000 expansion of strip annealing facilities at West Leechburg, Pa. Sharon Steel Corp. will expand steel coil annealing facilities to the tune of $413,000 at Farrell, Pa. Quick amortization on 40 per cent of this amount is allowed.

Boston — There is less open-end flat-rolled tonnage available for late second quarter, and preliminary mill allotments for third quarter are getting the

ax. Longer range tightness in sheets and strip stems from continued heavy requirements of the automobile industry. Latter plans to drop high-cost conversion deals and toss this tonnage direct into mill hoppers in third quarter.

Cleveland—With automotive and appliance industries pressing for all the tonnage they can get prospects are dim for any early easing in supply conditions in the sheet and strip markets. Pressure is exceptionally strong for cold-rolled, but hot-rolled, electrical and enameling grades also are in strong demand. The mills are booked full through second quarter and are turning away tonnage requests.

Cincinnati—Order books are full through second quarter and, in some cases, are almost filled through the middle of third quarter. Pressure is increasing on the smaller mills. Shipments are behind 45 to 60 days. Some inventory accumulation is noted.

Chicago—Sheet demand, overwhelming because of tremendous pressure from automobile builders, is expanding as household appliance makers, optimistic over their sales prospects, seek more generous supply.

St. Louis—Demand for galvanized sheets has taken a new sprint. The upturn may be seasonal. Cold-rolled sheets continue in extremely tight supply. Manufacturers of farm equipment and household appliances are pressing for deliveries.

Los Angeles—Movement of Japanese flat-rolled steel is slowing. Weaker demand from fabricators, coupled with increased competition from a recent drop in prices of European steel is noted.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 147

Seattle—Rolling mills operate at capacity here. Order backlogs are shrinking. New public works contracts await official clearance by Washington. Inquiries for small tonnages are numerous.

Structural Shapes . . .

Structural Shape Prices, Page 147

New York—Bids will be opened Apr. 16 on 13,207 tons for the Tappan Zee bridge over the Hudson river off Rockland county, New York, in connection with the state thruway. On the same date an additional 3500 tons of bridge work for the thruway in Ulster and Herkimer counties will come up for bids.

Boston—Bridge and girder work in the larger structural fabricators' backlogs is reflected in more extended deliveries, January, as compared with September-October, for beam designed structures. Smaller district shops are not so far extended, averaging three to four months.

Philadelphia—Structural awards are light but there is growing inquiry. Contracting should soon become more active. Fabricators' backlogs already are sufficient to keep them going for many weeks.

Pittsburgh—Structural fabricators see sufficient business in the offing to carry them through January of next year. One shop currently is worrying about where to place about

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11 months of work which should be completed by end of summer. It has the tickets to get steel but can find no takers.

Seattle—Bethlehem Pacific Coast Steel Corp. booked 12,000 tons of galvanized shapes for 163 transmission towers for the Bonneville Power Administration 345-kv Chief Joseph, Snohomish line. Plant backlogs are shrinking. It is feared reinstatement of suspended government projects will create a supply bottleneck later.

Wire . . .

Wire Prices, Page 149

Pittsburgh—Manufacturers wire products demand is showing signs of slackening.* Some open space is reported for second quarter, and substantial tonnage is expected to be available during third quarter.

Boston—Open-end tonnage for late second quarter includes mostly finer sizes against which all tickets have not been converted into orders. Available in good volume is plain galvanized wire. Upholstery spring wire and cold-heading stock are sold through June.

New York—American Steel & Wire Division, U.S. Steel Corp., will supply from its Trenton, N. J., plant 13,000 tons of wire for cables for the 8614-foot suspension bridge section of a bridge spanning the Straits of Mackinac.

Tubular Goods . . .

Tubular Goods Prices, Page 151

Boston—On direct shipment of merchant steel pipe to consumers suppliers are sold through June. Distributors are passing up 30 to 35 per cent of monthly buttweld allotments. Up to now this volume has been diverted into direct shipment channels. All seamless under 10-inch finds a ready market. Tubing specialties, mechanical and pressure, are sold through second quarter. Usual seasonal lift in cast iron pipe is somewhat below normal.

Pittsburgh—Producers of seamless pipe expect strong demand through third quarter. Buttweld pipe is less tight. Current programs and newly announced pipe lines on planning boards are expected to keep demand for oil country goods at a high point most of this year.

Seattle—The cast iron pipe market is showing seasonal improvement. Several sizable tonnages are pending, including 700 tons in two water districts near Seattle, and 175 tons at Astoria, Oreg.

Plates . . .

Plate Prices, Page 147

Philadelphia—With controls after June 30 confined only to needs of the Defense Department and Atomic Energy Commission, plate producers will have the bulk of their tonnage available for distribution as they please in third quarter. Speculation prevails as to what effect decontrol will have on production of strip plate.

Pittsburgh—Plate consumers can use all their current allocations through second quarter, and if receipts continue on the same basis as previously, they have orders that will take up their capacity July through January. Should strip mills currently producing plates curtail such production a tighter market than ever for plates will result.

Boston—Heavy and wide plates are sold through second quarter. Armament requirements will be strong through remainder of the year. Where plate shops can use lighter gages in narrow and medium widths they are getting more tonnage.

New York—While some plate mills are becoming more current on their commitments, they are still in receipt of more inquiry than they can handle. Producers generally are out of the market for first half.

Chicago—Plate consumers expect the government will allow to expire on June 30 its directive on use of strip mills to roll light plates.

Pig Iron . . .

Pig Iron Prices, Page 146

New York—Blast furnace production in February amounted to 5,881,518 tons, bringing the total for the first two months of the year to 12,415,901 tons, or 97 per cent of capacity, according to the American Iron & Steel Institute. Operations averaged 96.6 per cent in February. Production during the month was comprised of 5,813,202 tons of pig iron and 68,316 tons of ferroalloys. Iron output in the first two months this year amounted to 12,195,283 tons and ferroalloy output, 150,618 tons. Comparative figures are given in the following table:

BLAST FURNACE PRODUCTION
(Gross Tons)

	February 1953	January 1953	February 1952
Pig iron	5,813,202	6,482,081	5,722,67
Ferroalloys	68,316	82,302	63,02
Total	5,881,518	6,564,383	5,784,69

New York—Demand for foundry pig iron here is none too pressing. There has been little improvement in foundry operations, with most shops at about 70 per cent of normal and most in a fairly comfortable position as to iron inventories.

Boston—While most of the production of the Everett furnace was shipped during March, consumers have brought up inventories on the basis of current melt and more tonnage is expected to go into stockpiles in April. Melt changes little.

Buffalo—Early vessel shipments of merchant pig iron continue heavy from this lake port. Michigan and local automotive foundries are active buyers in the merchant iron market.

Philadelphia—The pig iron market is steady here with little change in movement of either basic or foundry grades. Gray iron foundry operations are lagging and foundry grades are plentiful. The Chester, Pa. furnace was scheduled to be blown in this past weekend. Feature of the market is the purchase by the Claymont, Del. consumer of 60,000 tons of Australian basic iron at prices understood to be fully competitive with the domestic market. The first 20,000 tons are scheduled for delivery within the next four to five months.

Chicago—Demand for pig iron holds all the strength it has been displaying in recent weeks. Foundries serving the automotive industry are busy and those supplying

the household appliance field are benefitting from larger releases for castings.

Cleveland Not much change in the pig iron market situation is noted here. Merchant sellers are disposing of their available tonnage but they are more aggressively pressing sales. Foundry operations continue spotty.

St. Louis Minor reshuffling in consumer pig iron allocations is under way as production improves. Quotas have not been boosted materially for a year.

Iron Ore . . .

Metallurgical Coke Prices, Page 151

Cleveland Marking one of the earliest lake shipping season openings on record, ore carriers are beginning to move toward the head of the lakes. Expectations are the first cargoes will be coming down to lower lake ports shortly.

Latest data of the Lake Superior Iron Ore Association show total stocks on Mar. 1 were 29,948,749 gross tons, comparing with 29,207,-005 on Mar. 1 a year ago. Consumption of ore during February was off sharply, reflecting the shorter month. Use was reported at 7,395,991 tons, comparing with 8,292,985 in January and 7,233,310 in February 1952. Cumulative consumption this year to date is 15,688,579 gross tons, against 14,-760,692 in the like period of last year.

Scrap . . .

Scrap Prices, Page 151

Pittsburgh The scrap market is described as steady. Now that the threat of inclement weather and possible curtailment of scrap yard operations seem unlikely, mills are reducing their inventories. Purchases are only of the best quality grades of No. 1 steel. Prices are being quoted on No. 2 bundles $1 to $2 under a week ago.

Cleveland Noticeably weaker tone is developing in scrap here. Buying is at a standstill with the mills depending on their substantial stocks to support current high-level ingot production. One mill will not purchase as much tonnage for April as had been expected. As a result, a decline of $2 to $3 per ton on No. 1 heavy melting steel is anticipated in some quarters. Last week No. 2 heavy melting was quoted off about $1 at $42 to $42.50, and turnings were down about $1. Foundry grades of scrap are moving sluggishly but for the time being prices are unchanged. Railroad grades are strong but unchanged pending placing of April lists.

Detroit Despite rising labor costs and strong demand, scrap trade observers in this area see prices as holding steady or dropping slightly in the period ahead. Scrap men are somewhat surprised by the brisk business levels of the past few weeks.

New York Tone of the scrap market is easier, but confusion with regard to prices for No. 1 heavy melting steel continues. Leading buyers are out of the market. Recent high prices for low phos brought out considerable material with the result brokers shaved buying prices to a range of $41 to $41.50.

Buffalo Prices on cast scrap hold unchanged but dealers report buying

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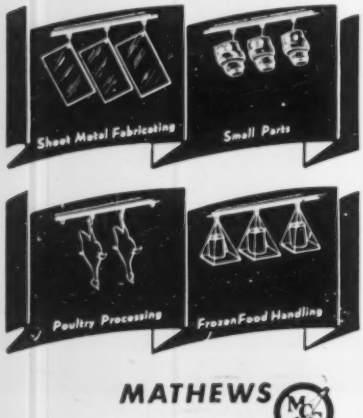

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interest low. Price on No. 1 heavy melting steel is quoted up about $2 per ton to a range of $46.50 to $47.50.

Philadelphia—Steel scrap prices remain unchanged with top grades largely nominal. The situation is still confused although an early test of prices on No. 2 heavy melting is expected with some new contracts under negotiation. Cast grades are unchanged with demand moderate.

Cincinnati—Scrap shipments are in good volume. Dealers are not holding back tonnage. Mills have substantial inventories. Dealer grades in April are apt to be priced higher than lower, particularly No. 2 bundles.

Chicago—Mill purchases of steelmaking scrap last week for April delivery confirmed prices which have been prevailing here. No. 1 grades remain at former OPS ceilings. No. 2 bundles at $38.50 delivered, including commission, are off $4 a ton from former ceilings. Blast furnace grades are listless and the price level has sagged $2 a ton. There is little trading in foundry items and prices vary considerably.

St. Louis—No. 2 bundles are off $2 to $4 here on heavy buying at the lower figure in Chicago. Softening was hastened when a big local consumer lifted an embargo on deliveries but quickly replaced it with a 1-car-a day rationing order. No. 1 steel is holding steady.

Birmingham—Scrap remains inactive, especially since the district's largest user holds temporarily out of the market. Cast grades are not in particularly strong demand. Supplies are moderate.

Los Angeles—With mill buying subdued, scrap prices are tending toward lower levels. One major steel producer is out of the market on all grades. Beginning Apr. 1, mills will price No. 3 bundles at $3 less than No. 2 bundles.

San Francisco—Recently established lower prices and comfortable mill inventories are tending to give the steel scrap market a sluggish appearance. Deliveries are slow.

Seattle—Mill scrap inventories are at a point where large consumers feel they are in better position than at any time since the war. Receipts are ample. However, since the drop in mill prices recently shipments have decreased.

Warehouse . . .

Warehouse Prices, Page 153

Cleveland—District warehouse operators' order volume is increasing under pressure from rising seasonal demands. Opening up of the construction season is reflected in a stepup in requirements for building steel products. Manufacturing operations are being pushed at fast pace in this area and the shortage of certain products at mill level, notably cold-rolled sheets and large bars, is placing an added burden on distributors.

Boston—Higher sales mark March volume with warehouses, but sales are retarded by want of balance in stocks.

Pittsburgh—Balanced warehouse inventories are still a long way off. A few mills are behind on shipments which does not ease the distributors' problem of supplying their customers with all they need. Some warehouses complain the shipment lag is almost 30 days.

Cincinnati—Inventories are spotty. Galvanized sheets continue to move slowly. Hot and cold-rolled sheets face strong demand. Structurals are in tight supply. There are some indications of inventory accumulation.

Los Angeles—One fabricator here, a buyer of warehouse steel, measures his success in getting tonnage by the number of telephone calls required to locate his needs. Current Score: 12 gage galvanized, 6 calls; hot-rolled, pickeled and oiled, 10 calls.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 151

Chicago—Foundry coke shipments have never become current since the surge in demand in February when consumers found inventories too low. Stocks are reasonably good now but shipments are running about a week behind.

Canada . . .

Toronto, Ont.—Production of primary iron and steel shapes in Canada in December, 1952, amounted to 393,805 net tons against 388,331 in November and 375,867 in December, 1951. Shipments for sale were 258,722 net tons compared with 250,067 in November and 247,555 in December, 1952.

For all of 1952 production totaled 4,850,068 net tons compared with 4,800,820 tons in 1951. Shipments for the full year were 3,139,114 net tons compared with 3,121,007 tons in 1951.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

20,000 tons, superstructure, including truss spans and suspension bridge, Straits of Mackinac, Michigan, to American Bridge Division, U. S. Steel Corp.

12,000 tons, galvanized transmission towers for Bonneville Chief Joseph-Snohomish 345-kv. line, to Bethlehem Pacific Coast Steel Corp., San Francisco, low, $2,844,406.

5,000 tons, 26-story office building, Webb & Knapp, West 34th St., New York, to Bethlehem Steel Co., Bethlehem, Pa.

1,600 tons, Scott Paper Co.'s plant addition, Everett, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; Howard S. Wright & Co. Inc., Seattle, and American Pile Driving Co. Inc., Everett, awarded general contract.

600 tons, organization maintenance shop, Ft. Richardson, Alaska, to Leckenby Structural Steel Co., Seattle; Lease & Leichland, Seattle, general contractors.

266 tons, warehouse, David O. Evans, Hillside, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, gates and equipment, Box Canyon dam, Washington state, to Pacific Car & Foundry Co., Seattle.

100 tons, power house, Crown Zellerbach Paper Co., Port Angeles, Wash., to Isaacson Iron Works, Seattle.

Unstated, 7½-ton gantry crane for Lookout Point dam, to Judson Pacific Murphy Co., Emeryville, Calif., low, $33,162 to U. S. Engineer, Portland, Oreg.

STRUCTURAL STEEL PENDING

43,207 tons, Tappan Zee bridge over Hudson, off Rockland county, New York, bids Apr. 16; bids will be taken separately on 17,000 tons for east and west approach spans, truss and stringer type on existing bents and on 26,207 tons for steel bents on existing concrete foundations and main spans, a cantilever truss with suspended span, or a combination of both; approximately 4000 tons of approach work for this project were

placed a few weeks ago with American Bridge Division, United States Steel Corp., Pittsburgh.

2586 tons, state thruway, Ulster county, New York, bids Apr. 16; J. S. Bixby, district engineer, Poughkeepsie, N. Y.

2100 tons, hangars No. 2 and 3, Kirtland Air Field base; bids to Corps of Engineers, Albuquerque, N. Mex., Apr. 2.

932 tons, state thruway, Herkimer county, New York, bids Apr. 16; L. Ketchum, district engineer, Utica, N. Y.

430 tons, reconstruction of viaduct, Buffalo, H. F. Stimm Inc., low on general contract.

400 tons, factory, Hercules Powder Co., Hopewell, Va.; bids Mar. 31.

350 tons, power plant extension, naval shipyard, Boston.

300 tons, plant addition, Budd Co., Philadelphia; bids closed Mar. 27.

250 tons, shop, Pennsylvania railroad, Hollidaysburg, Pa.; bids Apr. 1.

175 tons, pumps and equipment, including 75 tons of reinforcing bars, six pumping plants, Columbia Basin project; bids to Bureau of Reclamation, Ephrata, Wash., Apr. 16.

Unstated, steel frame, steam and boiler plant, reactor testing station; bids to Atomic Energy Commisson, Idaho Falls, Idaho, early April.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2350 tons, Bromley Park housing project, Boston, to Joseph T. Ryerson & Son Inc., Cambridge, Mass., through M. S. Kellner Co., Boston, general contractor.

2150 tons, state bridge, New York state thruway, Montgomery county, N. Y., two contracts, to Bethlehem Steel Co., Bethlehem, Pa., through B. Perini & Sons Inc., Framingham, Mass., general contractors.

1700 tons, Scott Paper Co. expansion, Everett, Wash., to unstated California supplier.

1250 tons, Tacoma Light Department to Northwest Steel Rolling Mills Inc., Seattle; bids for public utilities shop building, called by Tacoma, Apr. 13.

REINFORCING BARS PENDING

1000 tons, Market Terminal building, Boston.

Unstated, 6-story dormitory, 300 student capacity; bids to Rev. A. A. Lemieux, president, Seattle University, Apr. 8.

PLATES . . .

PLATES PENDING

120 tons, Water District No. 42, Seattle; bids in, several schedules.

PIPE . . .

CAST IRON PIPE PLACED

1000 tons, 4- to 16-inch, Worcester, Mass., to Warren Pipe & Foundry Co., Everett, Mass.

600 tons, 6- to 16-inch, Yarmouth, Mass., to R. D. Wood Co., Florence, N. J.

350 tons, 8- to 12-inch, Canton, Mass., to R. D. Wood Co., Florence, N. J.

CAST IRON PIPE PENDING

450 tons, Water District No. 42, Seattle; bids in.

400 tons, 8-inch, Springfield, Mass.; bids in.

250 tons, water system, Winslow, Wash., Hanson Construction Co., Seattle, low general contract, $80,044; Reliable Welding Works, Olympia, Wash., low $9619 for steel reservoir.

175 tons, John Day Water District, Astoria, Oreg., 6- and 4-inch; bids Apr. 1.

STEEL PIPE PENDING

3800 tons, 36- and 48-inch steel pipe, Springfield, Mass.; R. Zoppo Co., Lindale, Mass., general contractor.

RAILS, CARS . . .

RAILROAD CARS PLACED

Pacific Fruit Express, 200 seventy-ton refrigerator cars to own shops, Roseville, Calif.

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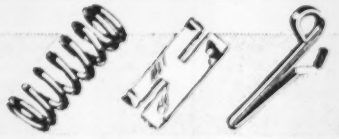
WIRE FORMS



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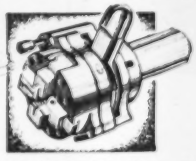

famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

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Pacific Coast Representative: A. C. Berbrugger, 334 N. San Pedro St., Los Angeles, California Canada: F. F. Barber Machinery Co., Toronto, Canada

There's a reason 76%*
of all popularly-priced Tool and Cutter Grinders sold in 1952 were "*Knock-Outs*"

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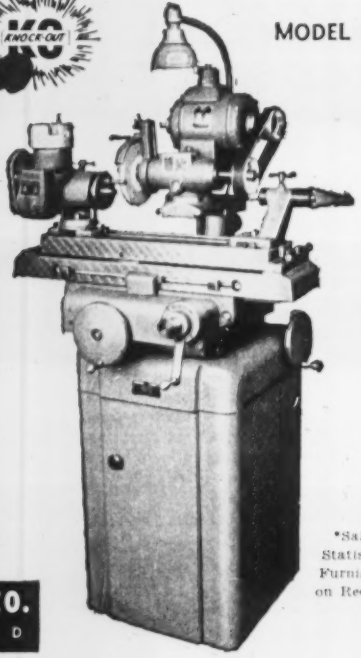

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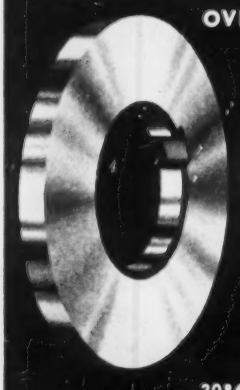

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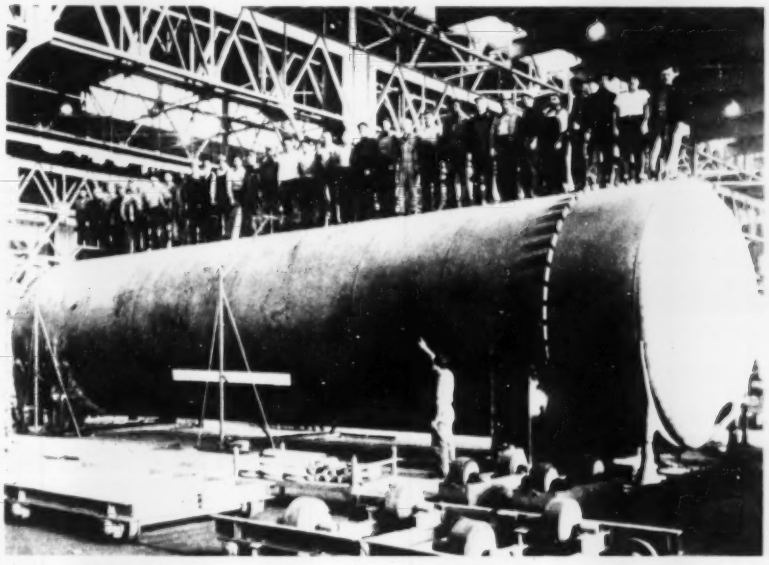


This Should Quench Your Thirst!

If each of the 32 men standing atop this 54-foot long brewery storage tank poured ten glasses of water into it daily, it would necessitate 8½ years for them to fill the tank. Pfaudler Co., Rochester, N. Y., asserts that it is among the largest single-unit metal glass-lined tanks in the U.S. It weighs 25 tons

Complete Construction Plans

Construction plans have been completed for the Pennsylvania Railroad's scrap and reclamation project at Hollidaysburg, Pa.

New Weapon against Cancer

Tracerlab Inc., Boston, developed a needle injecting radioactive wire into the human body. Made radioactive at the Oak Ridge atomic energy pile, the wire gives off cancer-attacking rays. The instrument is being used and studied at Boston's Massachusetts General Hospital.

Buys E-Z Mills Property

National Carbon Co. bought the E-Z Mills property in Bennington, Vt., vacant since last July. After extensive modernization, work will start on defense contracts.

W. E. Bassett Opens Plant

W. E. Bassett Co., makers of nail clippers and manicure implements, opened a new plant at Derby, Conn. The new building contains 25,000 square feet of floor space.

Big Gains for Flexible

In five years, Flexible Tubing Co., Guilford, Conn., jumped from zero to $2 million in annual sales. The com-

Name New Distributors

Newly-named distributors in Arizona and Louisiana for products of Allis-Chalmers Mfg. Co., Milwaukee, are Jongeward Electric Motors Inc., Yuma, Ariz., and Electrical Distributors Inc., Lake Charles, La.

Rolled Alloys Now Independent

Rolled Alloys Inc., Detroit, formerly a division of Michigan Steel Casting Co., is now an independent company handling rolled mill forms of chrome-nickel alloys.

Honor Two with Award

Joseph B. Tate of Witt Cornice Co., Cincinnati, and Frederick C. Brightly Jr. of Brightly Galvanized Products Co., Cicero, Ill., were presented the Thomas M. Gregory Memorial Award for 1951 and 1952 respectively at the American Hot Dip Galvanizers Association's annual meeting. The award is presented in honor of outstanding contributions to the industry.

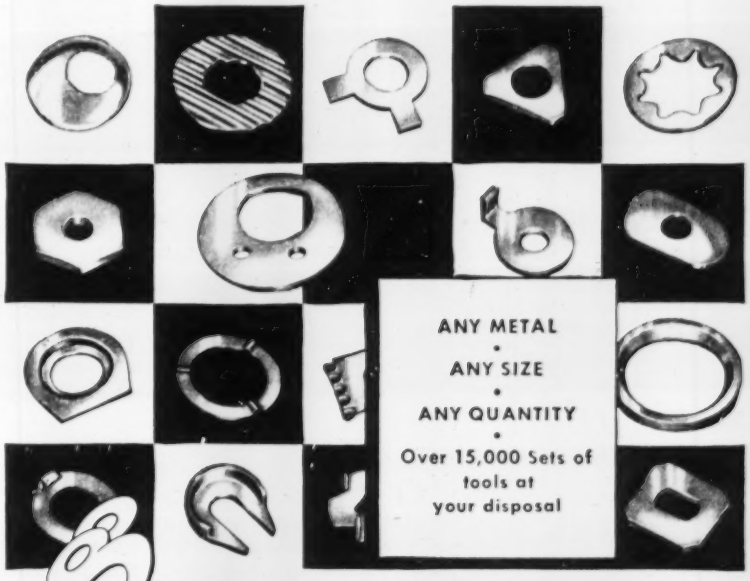
Changes Subsidiary's Name

Diamond Alkali Co., Cleveland, changed the name of its subsidiary, Kolker Chemical Works Inc., to Diamond Alkali Organic Chemicals Division Inc.

IT'S A SMART MOVE TO ORDER

Special Washers

FROM A LEADER



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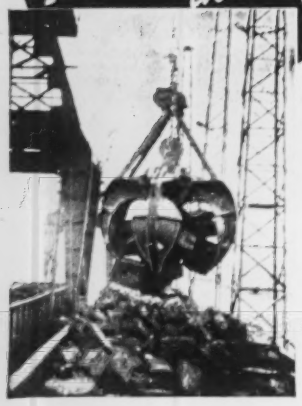

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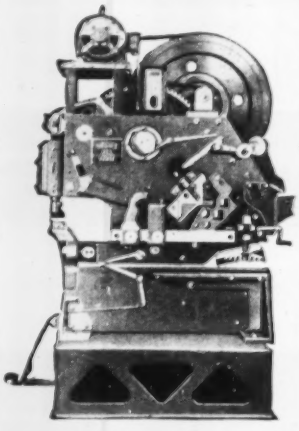

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Teaching Shovel Operation by Comic Strips

Designed to instruct rather than entertain, a comic strip distributed by Caterpillar Tractor Co., Peoria, Ill., shows excavators how to use cable and hydraulic shovels. Printed in four colors, the comic contains no Mickey Mouse but illustrates operation of such Caterpillar products as a T7 cable traxcavator shovel

pany, expecting a 30 per cent general increase in 1953, produces lightweight flexible tubing made of wire and plastic-coated fabric. Started in 1917 with two employees, Flexible Tubing now has a modern plant with more than 200 workers.

Fire Damages Plant

West Side Structural Steel Co., Watervliet, N. Y., was extensively damaged by a recent fire. One building was destroyed and one damaged.

Billings on Forgings Double

Consolidated Industries Inc., West Cheshire, Conn., reports that net billings on aircraft forgings for the first two months of this year were double the billings for the same period in 1952. Consolidated Industries produces titanium forgings.

Luria To Build for Lenox

Lenox Inc., Trenton, N. J., contracted with Luria Engineering Co., Bethlehem, Pa., for construction of a 144,000-square-foot plant at Cologne, N. J. About 600 workers will be employed at the new building.

AEC Plant Starts Operation

A new chemical processing plant at a testing station of the Atomic Energy Commission in Idaho Falls, Idaho, began operation. The plant will recover fissionable material from used reactor fuel elements.

Beloit Wins Machine Contract

Beloit Iron Works, Beloit, Wis., will build newsprint machines for Great Northern Paper Co., Millinocket, Me., on a $32 million contract.

Joseph H. Field Honored

Joseph H. Field, manager of the steel window and door department of Ceco Steel Products Corp., Chicago, was elected chairman of the board of directors of the Steel Window Institute.

U. S. Hoffman Converts Shops

U. S. Hoffman Machinery Corp. is spending about $23 million for machine tools and facilities to convert the former Lackawanna Railroad locomotive shops in Scranton, Pa., to ordnance production.

Canadian Agent Named

Peerless Brothers Agencies Ltd. of Vancouver, B. C., will be Canadian representatives for Continental

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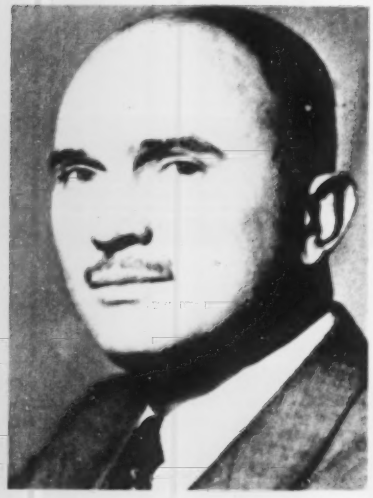

Heads Tool Engineers

Roger F. Waindle was elected president of the American Society of Tool Engineers at the annual meeting in Detroit. Mr. Waindle is vice president, Cannon-Muskegon Corp. and director of research, Nugent Sand Co. Inc., Both firms are in Muskegon, Mich.

Equipment Co., Coraopolis, Pa., manufacturers of butterfly valves.

Maremont Buys Two Companies

Maremont Automotive Products Inc., Chicago, purchased two Cleveland companies. The firms are Accurate Parts Mfg. Co. and Replacement Unit Co. Both will be operated

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3—8" x 12" United 2-High Cold Mills with Combination Pinion Stands and Gear Sets; D. C. Motor Drives; Coilers.
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Bullard 42" Vertical Boring Mill, late type, 4 jaw chuck table.
Niles 36-44 Vertical Boring Mill.
King 42" Vertical Boring Mill, 2 heads.
Niles 42"-56" Driving Box Borer, Burnisher and Facer, late type.
Brown & Sharpe #3 Vertical Miller.
Cincinnati #5 Hi-Power Vertical Miller.
Hill Planetary Style D Miller.
Gould & Eberhardt 96 H Hobber.
Heald #36 Internal Grinder.
Sellers 4T Tool Grinder, motor drive.
Sellers 6T Tool Grinder, late type.
Landis 16 x 72 Plain Cylindrical Grinder.
Brown & Sharpe #12 Plain Grinder, reversing mechanism.
Heald #20A Internal Grinder.
Heald #78 Centerless Internal & Cylindrical Grinder, late type, complete.
Heald 42 Borematic.
Jones & Lamson 8 x 31 Thread Grinder.
Heald 72-A3 Plain Internal Grinder.
Lodge & Shipley 16" x 6" single pulley drive 12 spindle speeds.
American 16" x 8' 2 SCD, 56" center distance, 3½" hole in spindle.
Blount Model B-3 Special Application Lathe for Turning, 20" swing, 2⅝" hole in spindle, 54" centers.
Bradford 26" x 18", 4 SCD, 12" center distance, loose change.
Gould & Eberhardt 16" Back Geared Shaper.
Gould & Eberhardt 24" Back Geared Shaper.
Gould & Eberhardt 28" Shaper, gear box.
Smith & Mills 32" Shaper, gear box.
Fellows 22" Gear Shaper with Spur Guide.
Fellows 612 Spur Gear Shaper.
Brown & Sharpe 3-26 Gear Cutter.
Oliver Template Tool Bit Grinder.
Lodge & Shipley 16" x 126" centers G.H. Lathe, Timken bearing, complete with taper attachment, late type.
Niles 48" x 48" x 16' Double Housing Planer, 4 heads, box table, D.C. reversible drive.
Landis 26" x 168" Plain Cylindrical Grinder.
American 30" x 14' G.H. Lathe, 12 speed.
Monarch 24" x 12' G.H. Lathe, complete with 22" 4 jaw chuck and taper attachment.
American 36" x 40' Lathe, Internal Face Plate Drive, with 4" raising blocks, 33" center distance.
Bliss #58 Drawing Press, 5" stroke.
Pond 44 x 84 x 16' Double Housing Planer, 15 H.P. motor drive, 4 heads.
Cincinnati #2 Centerless Grinder.
Cincinnati-Bickford 3½" Radial Drill.
Hanchett No. 000-36" UK Traveling Wheel Face Grinder, new 1946, table 22" x 36" long, 10 HP grinding wheel motor.
Baker #217 Upright Drill Press.
Gisholt 11, Saddle Type Turret Lathe with bar feed, late type.
Milwaukee 24 Plain Miller, late type.
Milwaukee 2H Plain Miller, late type.
LeBlond #2 Tool & Cutter Grinder, late.
Brown & Sharpe 3A Universal Miller.

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MODERN FOUNDRY, WITH ACID OPEN-HEARTH FACILITIES, HAS CAPACITY FOR PROMPT DELIVERY OF CARBON AND LOW-ALLOY STEEL CASTINGS RANGING UP TO 30,000 LBS. EXPERT PATTERN-MAKING, COMPLETE ENGINEERING AND MACHINING SERVICES ALSO AVAILABLE IF DESIRED.
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RAILROAD EQUIPMENT—*FOR SALE*

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STANDARD GAUGE FREIGHT CARS

Box, Steel Sheathed, 40-Ton Capacity
Box, Double Sheathed, 50-Ton Capacity
Box, Single Sheathed, 50-Ton Capacity
Flat, 50-Ton, Steel Underframe, 40'6" Long
Gondolas, Composite, or All Steel 50-Ton and 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Tank, 3,000-Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled

Hoppers, All-Steel, 70-ton, Cross Dump

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

CABOOSE CARS

Eight Wheel, Cupola Type

STANDARD GAUGE AIR DUMP CARS

Side Dump, 20-Yd., 40-Ton, Lift Door

End Dump, 20 Yd., 50-Ton Drop Door

Side Dump, 30-YD., 50-TON, DROP DOOR

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Burro Crane #15
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Interested in expanding our line of Steel items for distribution in New York, New Jersey, Connecticut and Eastern Pennsylvania. Suggestions will be gratefully received.

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MANUFACTURERS' REPRESENTATIVE with office located in Detroit, Michigan, desires additional lines. Now handling cold-headed items, springs, selling all automotive concerns and diversified industries. Desires well rated washer, stamping, or waste cloth line. Write Box 684, STEEL, Penton Bldg., Cleveland 13, Ohio.

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SALARIED POSITIONS $3,500 TO $25,000. WE offer the original personal employment service (established 43 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC., 110 Dun Bldg., Buffalo 2, N. Y.

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STEEL SALESMAN—Aggressive young man for trading in sales of our Swedish Cold Rolled Strip Steel Specialties and Tool Steels. Middle West territory, mainly Michigan. Send complete resume including education, experience and salary to Sales Manager, Uddeholm Company of America, Inc., 155 East 44th Street, New York 17, N. Y.

SALESMAN WANTED

By nationally known manufacturer to sell bear blades and circular knives on salary, bonus and expense basis. Strip mill experience preferred. Forward references. Replies held confidential. Write Box 696, STEEL, Penton Bldg., Cleveland 13, Ohio.

SALES EXECUTIVE

Manufacturer of steel joists, deck and culvert pipe, steel fabricator of structural reinforcing and miscellaneous iron, warehousing of related steel specialties. Operation in southwestern states, present volume 3000 tons monthly. Position requires promotion of products to architects and engineers, and selling to contractors and owners. Prefer men 35 to 45 years. Excellent opportunity for experienced producer. Write Box 700, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Steel fabricator of structural reinforcing and miscellaneous iron for the construction industry. At present processing 3000 tons per month. Need executive man with job experience background. Splendid opportunity for future development. Position now open due to retirement and an expected serious illness. Age range 35 to 45 years. Location southwest. Write Box 701, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Your identity is covered and present position protected by this oldest executive personnel service with 43 years standing and reputation. Employer will pay our fees and your moving costs.

Write at once in complete confidence, telling age and experience, for further information.

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Positions available for Design Engineers with experience in the design of mechanical equipment used in Blast Furnaces, Open Hearth Furnaces, Sintering Plants, Rolling Mills and other auxiliary plants for the processing and production of iron and steel. These men must have experience in Steel Plant layout as well as the design of equipment involved. These are permanent positions with excellent advancement opportunities for qualified Engineers who are interested in greater accomplishment.

If you qualify and are interested in advancing with a continually expanding organization, write, giving complete resume of positions held and duties performed, education, age, salary desired, etc., to:

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as wholly-owned subsidiaries of Maremont.

Wiesner-Rapp Expands

Wiesner-Rapp Co., Inc., Buffalo, purchased Kelley Electric Machine Co. of that city as part of its expansion and diversification program. Kelley manufactures machines used in laying concrete.

CARL L. IPSEN
. . . v. p. of Furnace Manufacturers

C. L. Ipsen Named to Association

Carl L. Ipsen is the new executive vice president of the Industrial Furnace Manufacturers' Association. He retired from General Electric Co. to accept the position. With G. E. for 39 years, he served as manager of the company's industrial heating department from 1947 until 1951 and then became chief of the Industrial Heating Equipment Section of the National Production Authority. During the past year he acted as chief consultant for the G. E. heating department.

D. E. Makepeace Consolidates

On Apr. 1, D. E. Makepeace Co., Attleboro, Mass., will be consolidated with Union Plate & Wire Co., of the same city. D. E. Makepeace will serve as the operating division of the new organization which will retain the name of Union Plate & Wire Co.

Steel Founders Present Awards

Henning A. Forsberg, vice president, Continental Foundry & Machine Co., East Chicago, Ind., received the Lorenz Memorial Gold Medal of the Steel Founders' Society of America. In the society's annual meeting, G. A. Lillieqvist, research director and chief metallurgist of American Steel Foundries, East Chicago, Ind., won the Technical and Operating Gold Medal for 1952. John A. Rassenfoss was awarded the annual Steel Foundry Facts prize. He is assistant research director at American Steel Foundries.

Adds to Branch Plant

Black & Decker Mfg. Co., Towson, Md., portable electric tool manufacturer, will build a 127,000-square-foot addition to its branch plant at Hampstead, Md. Partial operation is expected as early as next September.

Appoint Kenneth Gayle

Kenneth H. Gayle Jr., president of Ingalls Iron Works Co., Birmingham, was added to the Board of Associated Industries of Alabama.

Form New Association

The National Industrial Electronic Service Affiliates Inc. was formed in the interest of industrial electronic equipment users, equipment manufacturers and service technicians to make possible a pool of qualified industrial electronic technicians in all major industrial areas. The organization will service electronic devices in industrial plants.

Burroughs Adds New Department

Burroughs Adding Machine Co., Detroit, established an electronic instruments division in Philadelphia to produce electronic laboratory apparatus and other special devices.

Limestone Plant Planned

U. S. Steel Corp. plans to establish a limestone quarrying and processing plant at Cedarville in Michigan's upper peninsula. Construction will begin in April on the project, expected to produce about 3 million tons of metallurgical quality limestone a year.

High Proportion of Sales

Webster-Chicago Corp., Chicago, sold 41 per cent of all tape recorders made during 1952, sales representatives said. The report is based on records of the Armour Research Foundation which licenses all tape recorder manufacturers.

Award Vermejo Project Contract

A Bureau of Reclamation contract for construction of three dams and a dike on the Vermejo Project near Maxwell, N. Mex., was awarded to Colorado Constructors Inc., Denver, on a low bid of $850,212. This contract is the first to be awarded in the rehabilitation program for the 65-year-old project providing irrigation water for 7200 acres.

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OTTAWA STEEL PRODUCTS, INC.
GRAND HAVEN, MICHIGAN

A-1037

Above: For charging blast furnace.

EASTON experience covers all types of skips for automatic dumping at the top of an incline.

SKIP CARS

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Write for details on these machines to: PANGBORN CORPORATION, 1600 Pangborn Blvd., Hagerstown, Md.

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BLAST CLEANS CHEAPER
with the right equipment for every job

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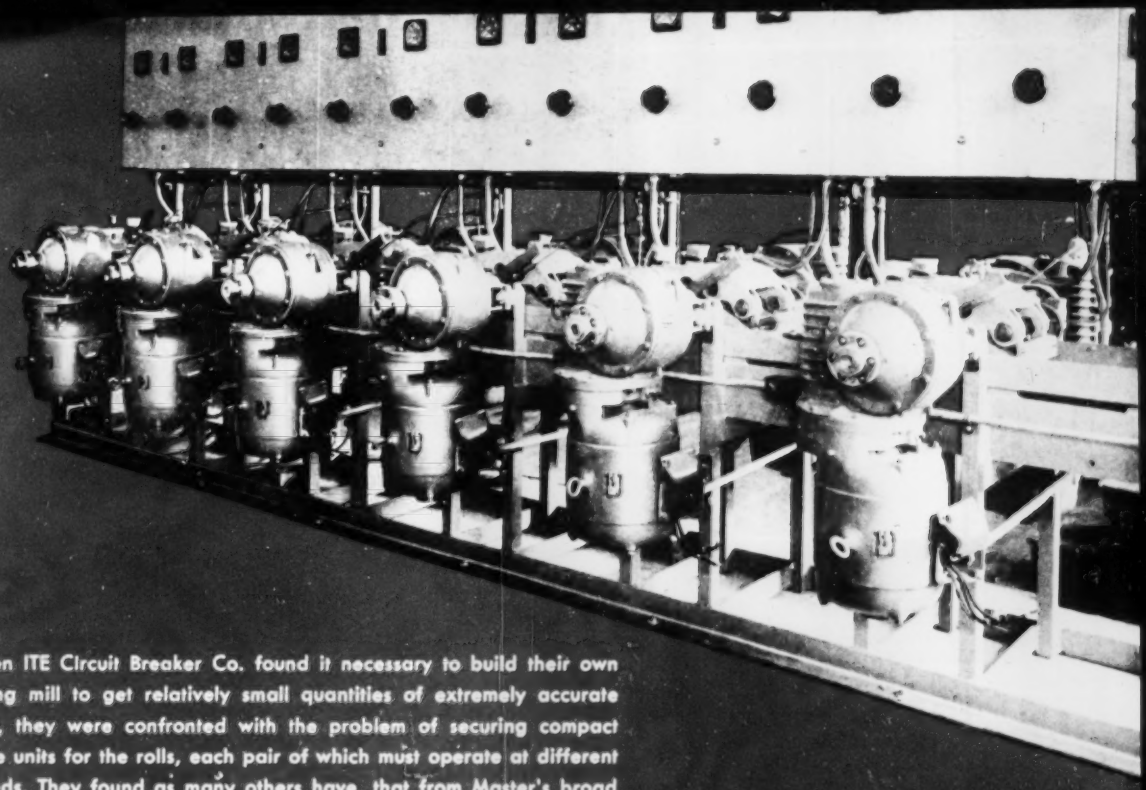

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Probably you will never design a rolling mill. But the next time you need motor drives for your plant or product, remember that Master Motors, available in thousands and thousands of types and ratings, give you a selection you can get nowhere else.

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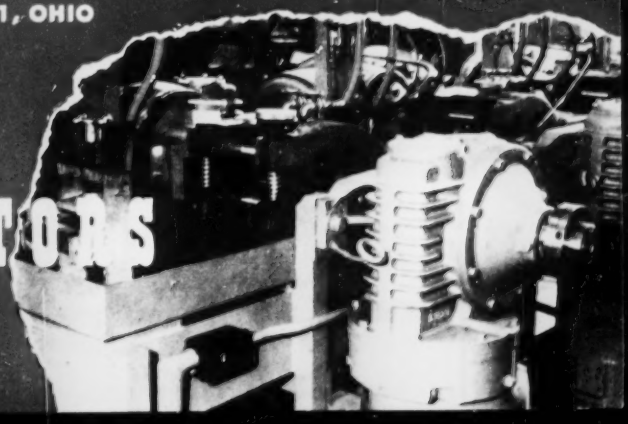
Open, enclosed, splash proof, fan-cooled, explosion proof . . . horizontal or vertical . . . for all phases, voltages and frequencies . . . in single speed, multi-speed and variable speed types . . . with or without flanges or other special features . . . with 5 types of gear reduction up to 432 to 1 ratio . . . with electric brakes . . . with mechanical variable speed units . . . and for every type of mounting . . . Master has them all and so can be completely impartial in helping you select the one best motor drive for YOU.

Select the RIGHT power drive from Master's broad line and you can increase the saleability of your motor driven products . . . improve the economy and productivity of your plant equipment.

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO

MASTER GEARMOTORS



World's biggest ladle crane trolley rides on TIMKEN® bearings

THIS trolley, built by The Alliance Machine Company, helps the world's largest ladle crane move tons of molten metal quickly and easily, with the utmost safety.

To insure smooth performance and greater availability, Alliance engineers have mounted each of the trolley's double-flange track wheels on Timken® tapered roller bearings.

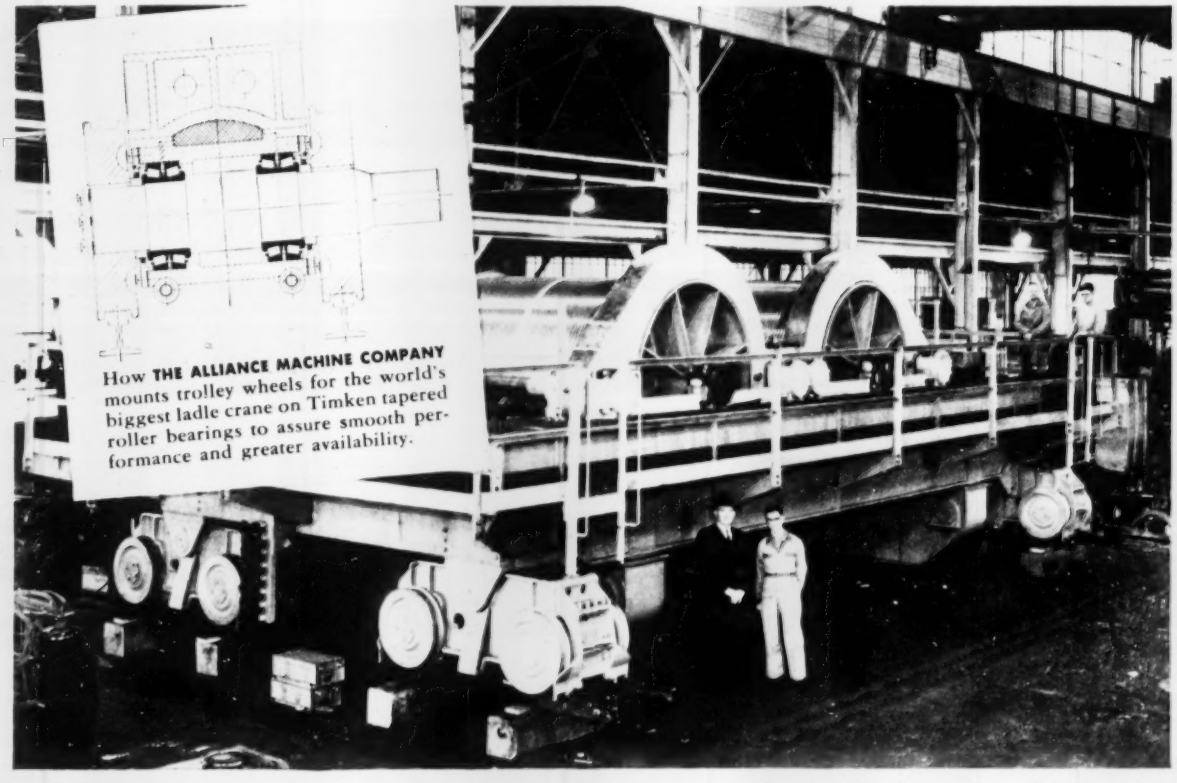
The tapered construction of Timken bearings enables them to take radial and thrust loads in any combination. Timken bearings provide high capacity in a small space because of line contact between rollers and races. As a result, they carry the heavy loads on the trolley's wheels with capacity to spare. The wheels start quickly, turn smoothly, with minimum friction because of the true rolling motion and incredibly smooth surface finish of Timken bearings.

Timken bearings hold housings and shafts concentric. As a result, closures are more effective—dirt stays out, lubricant stays in. Maintenance and lubrication costs are held to a minimum.

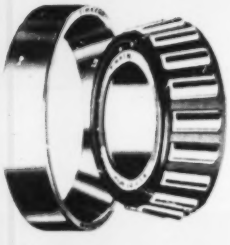
No other bearing can give you all the advantages you get with Timken tapered roller bearings. Specify them for the machinery you build or buy. Always look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".

TIMKEN ROLLER BEARING EQUIPPED

This symbol on a product means its bearings are the best.

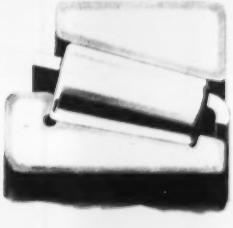


How **THE ALLIANCE MACHINE COMPANY** mounts trolley wheels for the world's biggest ladle crane on Timken tapered roller bearings to assure smooth performance and greater availability.



TIMKEN

TAPERED ROLLER BEARINGS



HARD ON THE OUTSIDE, TOUGH ON THE INSIDE

Rollers and races of Timken bearings are case-carburized to give a hard, wear-resisting surface and a tough, shock-resisting core. Result: longer bearing life.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis steels.

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION